ASIATICK RESEARCHES;

OR,

TRANSACTIONS

OF THE

SOCIETY INSTITUTED IN BENGAL,

FOR INQUIRING INTO THE

HISTORY AND ANTIQUITIES,

THE

ARTS, SCIENCES, AND LITERATURE,

OF

A S I A.

VOLUME THE SECOND.

Printed verbatim from the Calcutta Edition.

LONDON:

Printed by G. Auld, Greville-street,
FOR J. SEWELL; VERNOR AND HOOD; J. CUTHELL; J. WALKER;
R. LEA; LACKINGTON, ALLEN, AND CO.; OTRIDGE AND SON;
LONGMAN AND REES; R. FAULDER;
AND J. SCATCHERD.

1801.

ADVERTISEMENT.

It may greatly conduce to the advancement of uſeful knowledge, if the learned Societies eſtabliſhed in *Europe* will tranſmit to the Secretary of the Society in *Bengal* a Collection of ſhort and preciſe Queries on every Branch of *Aſiatic* Hiſtory, Natural and Civil, on the Philoſophy, Mathematics, Antiquities, and Polite Literature of *Aſia*, and on Eaſtern Arts, both Liberal and Mechanic; ſince it is hoped that accurate Anſwers may in due time be procured to any Queſtions that can be propoſed on thoſe ſubjects; which muſt in all events be curious and intereſting, and may prove in the higheſt degree beneficial to mankind.

I.

THE FOURTH ANNIVERSARY DISCOURSE,

DELIVERED 15 FEBRUARY, 1787.

BY THE PRESIDENT.

Gentlemen,

I HAD the honour laſt year of opening to you my intention to diſcourſe at our annual meetings on the *five* principal nations who have peopled the continent and iſlands of *Aſia*, ſo as to trace, by an historical and philological analyſis, the number of ancient ſtems from which thoſe five branches have ſeverally ſprung, and the central region from which they appear to have proceeded; you may, therefore, expect that, having ſubmitted to your conſideration a few general remarks on the old inhabitants of *India*, I ſhould now offer my ſentiments on ſome other nation, who, from a ſimilarity of *language*, *religion*, *arts*, and *manners*, may be ſuppoſed to have had an early connexion with the *Hindus*; but, ſince we find ſome *Aſiatic* nations totally diſſimilar to them in all or moſt of thoſe particulars, and ſince the difference will ſtrike you more forcibly by an immediate and cloſe compariſon, I deſign at preſent to give a ſhort account of a wonderful people, who ſeem in every reſpect ſo ſtrongly contraſted to the original natives of this country, that they muſt have been for ages a diſtinct and ſeparate race.

For the purpofe of thefe difcourfes I difcovered *India* on its largeft fcale, defcribing it as lying between *Perfia* and *China*, *Tartary* and *Java*; and, for the fame purpofe, I now apply the name of *Arabia*, as the *Arabian* geographers often apply it, to that extenfive peninfula which the Red Sea divides from *Africa*, the great *Affyrian* river from *Iran*, and of which the *Erythrean* Sea wafhes the bafe, without excluding any part of its weftern fides, which would be completely maritime, if no ifthmus intervened between the *Mediterranean* and the Sea of *Kolzom*: that country in fhort I call *Arabia*, in which the *Arabic* language and letters, or fuch as have a near affinity to them, have been immemorially current.

Arabia, thus divided from *India* by a vaft ocean, or at leaft by a broad bay, could hardly have been connected in any degree with this country, until navigation and commerce had been confiderably improved; yet, as the *Hindus* and the people of *Yemen* were both commercial nations in a very early age, they were probably the firft inftruments of conveying to the weftern world the gold, ivory, and perfumes of *India*, as well as the fragrant wood, called *Alluwwa* in *Arabic*, and *Aguru* in *Sanfcrit*, which grows in the greateft perfection in *Anam*, or *Cochinchina*. It is poffible too that a part of the *Arabian* idolatry might have been derived from the fame fource with that of the *Hindus*; but fuch an intercourfe may be confidered as partial and accidental only; nor am I more convinced than I was fifteen years ago, when I took the liberty to animadvert on a paffage in the Hiftory of Prince *Kantemir*, that the *Turks* have any juft reafon for holding the coaft of *Yemen* to be a part of *India*, and calling its inhabitants *Yellow Indians*.

The *Arabs* have never been entirely fubdued, nor has any impreffion been made on them, except on

their borders; where, indeed, the *Phenicians*, *Persians*, *Ethiopians*, *Egyptians*, and, in modern times, the *Othman Tartars*, have ſeverally acquired ſettlements; but, with theſe exceptions, the natives of *Hejaz* and *Yemen* have preſerved for ages the ſole dominion of their deſerts and paſtures, their mountains and fertile valleys; thus apart from the reſt of mankind, this extraordinary people have retained their primitive manners and language, features and character, as long and as remarkably as the *Hindus* themſelves. All the genuine *Arabs* of *Syria* whom I knew in *Europe*; thoſe of *Yemen* whom I ſaw in the iſle of *Hinzuan*, whither many had come from *Maſkat* for the purpoſe of trade; and thoſe of *Hejaz*, whom I have met in *Bengal*, form a ſtriking contraſt to the *Hindu* inhabitants of thoſe provinces: their eyes are full of vivacity, their ſpeech voluble and articulate, their deportment manly and dignified, their apprehenſion quick, their minds always preſent and attentive, with a ſpirit of independence appearing in the countenances even of the loweſt among them. Men will always differ in their ideas of civilization, each meaſuring it by the habits and prejudices of his own country; but, if courteſy and urbanity, a love of poetry and eloquence, and the practice of exalted virtues be a juſter meaſure of perfect ſociety, we have certain proof that the people of *Arabia*, both on plains and in cities, in republican and monarchical ſtates, were eminently civilized for many ages before their conqueſt of *Perſia*.

It is deplorable, that the ancient hiſtory of this majeſtic race ſhould be as little known in detail before the time of *Dhu Yezen*, as that of the *Hindus* before *Vicramaditya*; for, although the vaſt hiſtorical work of *Alnuwairi*, and the *Murujuldhahab* or *Golden Meadows* of *Almaſuudi*, contain chapters on the kings of *Himyar*, *Ghaſan*, and *Hirah*, with liſts of them and ſketches of their ſeveral reigns; and although genea-

logical tables, from which chronology might be better aſcertained, are prefixed to many compoſitions of the old *Arabian* Poets, yet moſt manuſcripts are ſo incorrect, and ſo many contradictions are found in the beſt of them, that we can ſcarce lean upon tradition with ſecurity, and muſt have recourſe to the ſame media for inveſtigating the hiſtory of the *Arabs* that I before adopted in regard to that of the *Indians*; namely, their *language*, *letters*, and *religion*, their ancient *monuments*, and the certain remains of their *arts*; on each of which heads I ſhall touch very conciſely, having premiſed that my obſervations will in general be confined to the ſtate of *Arabia* before that ſingular revolution at the beginning of the *ſeventh century*, the effects of which we feel at this day from the *Pyrenean* mountains and the *Danube*, to the fartheſt parts of the *Indian Empire*, and even to the Eaſtern Iſlands.

I. For the knowledge which any *European* who pleaſes may attain of the *Arabian* language, we are principally indebted to the univerſity of *Leyden*: for, though ſeveral *Italians* have aſſiduouſly laboured in the ſame wide field, yet the fruit of their labours has been rendered almoſt uſeleſs by more commodious and more accurate works printed in *Holland*; and, though *Pocock* certainly accompliſhed much, and was able to accompliſh any thing, yet the *academical* eaſe which he enjoyed, and his theological purſuits, induced him to leave unfiniſhed the valuable work of *Maidani* which he had prepared for publication; nor, even if that mine of *Arabian* philology had ſeen the light, would it have borne any compariſon with the fifty diſſertations of *Hariri*, which the firſt *Albert Schultens* tranſlated and explained, though he ſent abroad but few of them, and has left his worthy grandſon, from whom perhaps *Maidani* alſo may be expected, the honour of publiſhing the reſt: but the palm of glory in this branch of litera-

ture is due to *Golius*, whofe works are equally profound and elegant; fo perfpicuous in method, that they may always be confulted without fatigue, and read without languor, yet fo abundant in matter, that any man who fhall begin with his noble edition of the Grammar compiled by his mafter *Erpenius*, and proceed with the help of his incomparable dictionary, to ftudy his Hiftory of *Taimur* by *Ibni Arabfhah*, and fhall make himfelf complete mafter of that fublime work, will underftand the learned *Arabic* better than the deepeft fcholar at *Conftantinople* or at *Mecca*. The *Arabic* language, therefore, is almoft wholly in our power; and, as it is unqueftionably one of the moft ancient in the world, fo it yields to none ever fpoken by mortals in the number of its words and the precifion of its phrafes; but it is equally true and wonderful, that it bears not the leaft refemblance, either in words or the ftructure of them, to the *Sanfcrit*, or great parent of the *Indian* dialects; of which diffimilarity I fhall mention two remarkable inftances; the *Sanfcrit*, like the *Greek*, *Perfian*, and *German*, delights in compounds, but in a much higher degree, and indeed to fuch an excefs, that I could produce words of more than twenty fyllables, not formed ludicroufly, like that by which the buffoon in *Ariftophanes* defcribes a feaft, but with perfect ferioufnefs, on the moft folemn occafions, and in the moft elegant works; while the *Arabic*, on the other hand, and all its fifter dialects, abhor the compofition of words, and invariably exprefs very complex ideas by circumlocution; fo that if a compound word be found in any genuine language of the *Arabian* peninfula (*zenmerdah* for inftance, which occurs in the *Hamafah*) it may at once be pronounced an exotic. Again: It is the genius of the *Sanfcrit*, and other languages of the fame ftock, that the roots of verbs be almoft univerfally *biliteral*, fo that *five-and-twenty hundred* fuch roots might be formed by the

composition of the *fifty Indian* letters; but the *Arabic* roots are as universally *triliteral*, so that the composition of the *twenty-eight Arabian* letters would give near *two-and-twenty thousand elements* of the language: and this will demonstrate the surprizing extent of it; for, although great numbers of its roots are confessedly lost, and some, perhaps, were never in use; yet, if we suppose ten thousand of them (without reckoning *quadriliterals)* to exist, and each of them to admit only *five* variations, one with another, in forming *derivative nouns*, even then a perfect *Arabic* dictionary ought to contain *fifty thousand* words, each of which may receive a multitude of changes by the rules of grammar. The derivatives in *Sanscrit* are considerably more numerous: but a farther comparison between the two languages is here unnecessary, since, in whatever light we view them, they seem totally distinct, and must have been invented by two different races of men; nor do I recollect a single word in common between them, except *Suruj*, the plural of *Siraj*, meaning both a *lamp* and the *sun*; the *Sanscrit* name of which is, in *Bengal*, pronounced *Surja*; and even this resemblance may be purely accidental. We may easily believe with the *Hindus*, that *not even Indra himself, and his heavenly bands, much less any mortal, ever comprehended in his mind such an ocean of words as their sacred language contains*; and with the *Arabs*, that no man uninspired was ever a complete master of *Arabic*: in fact, no person, I believe, now living in *Europe* or *Asia*, can read without study an hundred couplets together, in any connection of ancient *Arabian* poems; and we are told, that the great author of the *Kamus* learned by accident from the mouth of a child, in a village of *Arabia*, the meaning of three words, which he had long sought in vain from grammarians, and from books, of the highest reputation. It is by approximation alone that a knowledge of these two venerable languages can be acquired; and, with moderate atten-

tion, enough of them may be known to delight and inftruct us in an infinite degree. I conclude this head with remarking, that the nature of the *Ethiopic* dialect feems to prove an early eftablifhment of the *Arabs* in part of *Ethiopia*, from which they were afterwards expelled, and attacked even in their own country by the *Abyffinians*, who had been invited over as auxiliaries againft the tyranny of *Yemen*, about a century before the birth of *Muhammed*.

Of the characters in which the old compofitions of *Arabia* were written, we know but little, except that the *Koran* originally appeared in thofe of *Cufah*, from which the modern *Arabian* letters, with all their elegant variations, were derived, and which unqueftionably had a common origin with the *Hebrew* or *Chaldaic*; but, as to the *Himyaric* letters, or thofe which we fee mentioned by the name of *Almufnad*, we are ftill in total darknefs; the traveller *Niebuhr* having been unfortunately prevented from vifiting fome ancient monuments in *Yemen*, which are faid to have infcriptions on them. If thofe letters bear a ftrong refemblance to the *Nagari*, and if a ftory current in *India* be true, that fome *Hindu* merchants heard the *Sanfcrit* language fpoken in *Arabia the Happy*, we might be confirmed in our opinion that an intercourfe formerly fubfifted between the two nations of oppofite coafts,—but fhould have no reafon to believe that they fprang from the fame immediate ftock. The firft fyllable of *Hamyar*, as many *Europeans* write it, might perhaps induce an etymologift to derive the *Arabs* of *Yemen* from the great anceftor of the *Indians*; but we muft obferve, that *Himyar* is the proper appellation of thofe *Arabs*; and many reafons concur to prove that the word is purely *Arabic*. The fimilarity of fome proper names on the borders of *India* to thofe of *Arabia*, as the river *Arabius*, a place called *Arabia*, a people named *Aribes* or *Ara*-

bies, and another called *Sabai*, is indeed remarkable, and may hereafter furnish me with observations of some importance, but not at all inconsistent with my present ideas.

II. It is generally asserted that the old religion of the *Arabs* was entirely *Sabian*; but I can offer so little accurate information concerning the *Sabian* faith, or even the meaning of the word, that I dare not yet speak on the subject with confidence. This at least is certain, that the people of *Yemen* very soon fell into the common, but fatal, error of adoring the sun and the firmament; for even the *third* in descent from *Yoktan*, who was consequently as old as *Nahor*, took the surname of *Abdushams*, or *Servant of the Sun*; and his family, we are assured, paid particular honours to that luminary: other tribes worshipped the planets and fixed stars; but the religion of the poets at least, seems to have been pure Theism; and this we know with certainty, because we have *Arabian* verses of unsuspected antiquity, which contain pious and elevated sentiments on the goodness and justice, the power and omnipotence, of *Allah*, or *the God*. If an inscription, said to have been found on marble in *Yemen*, be authentic, the ancient inhabitants of that country preserved the religion of *Eber*, and professed a belief *in miracles and a future state*.

We are also told, that a strong resemblance may be found between the religions of the pagan *Arabs* and the *Hindus*; but, though this may be true, yet an agreement in worshipping the sun and stars will not prove an affinity between the two nations: the *powers* of God, represented as *female* deities, the adoration of *stones*, and the name of the idol *Wudd*, may lead us indeed to suspect that some of the *Hindu* superstitions had found their way into *Arabia*; and, though we have no traces in *Arabian*

hiſtory of ſuch a conqueror or legiſlator as the great *Seſac*, who is ſaid to have raiſed pillars in *Yemen* as well as at the mouth of the *Ganges*, yet, ſince we know that *Sacya* is a title of *Buddha*, whom ſome ſuppoſe to be *Woden*, ſince *Buddha* was not a native of *India*, and ſince the age of *Seſac* perfectly agrees with that of *Sacya*, we may form a plauſible conjecture that they were in fact the ſame perſon who travelled eaſtward from *Ethiopia*, either as a warrior or as a lawgiver, about a thouſand years before *Chriſt*, and whoſe rites we now ſee extended as far as the country of *Niſon*, or, as the *Chineſe* call it, *Japuen*, both words ſignifying the *Riſing Sun*. *Sacya* may be derived from a word meaning *power*, or from another denoting *vegetable food*; ſo that this epithet will not determine whether he was a hero or a philoſopher; but the title *Buddha* or *wiſe*, may induce us to believe that he was rather a benefactor than a deſtroyer of his ſpecies: if his religion, however, was really introduced into any part of *Arabia*, it could not have been general in that country; and we may ſafely pronounce, that before the *Mohammedan* revolution, the noble and learned *Arabs* were Theiſts, but that a ſtupid idolatry prevailed among the lower orders of the people.

I find no trace among them, till their emigration, of any philoſophy but *ethics*; and even their ſyſtem of morals, generous and enlarged as it ſeems to have been in the minds of a few illuſtrious chieftains, was on the whole miſerably depraved for a century at leaſt before *Muhammed*. The diſtinguiſhing virtues which they boaſted of inculcating and practiſing, were a contempt of riches, and even of death; but, in the age of the *Seven Poets*, their liberality had deviated into mad profuſion, their courage into ferocity, and their patience into an obſtinate ſpirit of encountering fruitleſs dangers; but I forbear to expatiate on the manners of the *Arabs* in that age, becauſe the poems, en-

titled *Almoallakat*, which have appeared in our own language, exhibit an exact picture of their virtues and their vices, their wisdom and their folly; and show what may be constantly expected from men of open hearts and boiling passions, with no law to control, and little religion to restrain them.

III. Few monuments of antiquity are preserved in *Arabia*, and of those few the best accounts are very uncertain; but we are assured that inscriptions on rocks and mountains are still seen in various parts of the peninsula; which, if they are in any known language, and if correct copies of them can be procured, may be decyphered by easy and infallible rules.

The first *Albert Schultens* has preserved in his Ancient Memorials of *Arabia*, the most pleasing of all his works, two little poems in an elegiac strain, which are said to have been found, about the middle of the seventh century, on some fragments of ruined edifices in *Hadramut*, near *Aden*, and are supposed to be of an indefinite, but very remote age. It may naturally be asked,—In what characters were they written? Who decyphered them? Why were not the original letters preserved in the book where the verses are cited? What became of the marbles which *Abdurrahman*, then governor of *Yemen*, most probably sent to the *Khalifah* at *Bagdad?* If they be genuine, they prove the people of *Yemen* to have been 'herdsmen and warriors, inhabiting a fertile and well watered country 'full of game, and near a fine sea abounding with 'fish, under a monarchical government, and dressed in 'green silk, or vests of needle-work,' either of their own manufacture or imported from *India*. The measure of these verses is perfectly regular, and the dialect undistinguishable, at least by me, from that of *Kuraish*; so that, if the *Arabian* writers were much addicted to literary impostures, I should strongly sus-

pect them to be modern compofitions on the inftability of human greatnefs, and the confequences of irreligion, illuftrated by the example of the *Hymyaric* princes; and the fame may be fufpected of the firft poem quoted by *Schultens*, which he afcribes to an *Arab* in the age of *Solomon*.

The fuppofed houfes of the people called *Thamud*, are alfo ftill to be feen in excavations of rocks; and, in the time of *Tabrizi* the Grammarian, a caftle was extant in *Yemen* which bore the name of *Aladbat*, an old bard and warrior, who firft, we are told, formed his army, thence called *alkhamis*, in *five* parts, by which arrangement he defeated the troops of *Himyar* in an expedition againft *Sanaa*.

Of pillars erected by *Sefac*, after his invafion of *Yemen*, we find no mention in *Arabian* hiftories; and, perhaps, the ftory has no more foundation than another told by the *Greeks* and adopted by *Newton*, that the *Arabs* worfhipped *Urania*, and even *Bacchus* by name, which, they fay, means *great* in *Arabic*; but where they found fuch a word, we cannot difcover: it is true, that *Beccah* fignifies *a great and tumultuous crowd*; and, in this fenfe, is one name of the facred city commonly called *Meccah*.

The *Cabah*, or *quadrangular* edifice at *Meccah*, is indifputably fo ancient, that its original ufe and the name of its builder are loft in a cloud of idle traditions. An *Arab* told me gravely, that it was raifed by *Abraham*, who, as I affured him, was never there: others afcribe it, with more probability, to *Ifmail*, or one of his immediate defcendants; but whether it was built as a place of divine worfhip, as a fortrefs, as a fepulchre, or as a monument of the treaty between the old poffeffors of *Arabia* and the fons of *Kidar*, antiquaries may difpute, but no mortal can determine.

It is thought by *Reland* to have been *the mansion of some ancient patriarch, and revered on that account by his posterity*; but the room in which we now are assembled, would contain the whole *Arabian* edifice; and, if it were large enough for the dwelling-house of a patriarchal family, it would seem ill adapted to the pastoral manners of the *Kedarites*. A *Persian* author insists, that the true name of *Meccah* is *Mahcadah*, or the *Temple of the Moon*; but, although we may smile at his etymology, we cannot but think it probable that the *Cabah* was originally designed for religious purposes. Three couplets are cited in an *Arabic* history of this building, which, from their extreme simplicity, have less appearance of imposture than other verses of the same kind: they are ascribed to *Asad*, a *Tobba*, or king *by succession*, who is generally allowed to have reigned in *Yemen* an hundred and twenty-eight years before *Christ*'s birth; and they commemorate, without any poetical imagery, the magnificence of the prince *in covering the holy temple with stripped cloth and fine linen, and in making keys for its gate.* This temple, however, the sanctity of which was restored by *Muhammed*, had been strangely profaned at the time of his birth, when it was usual to decorate its walls with poems on all subjects, and often on the triumphs of *Arabian* gallantry and the praises of *Grecian* wine, which the merchants of *Syria* brought for sale into the deserts.

From the want of materials on the subject of *Arabian* antiquity, we find it very difficult to fix the chronology of the *Ismailites* with accuracy beyond the time of *Adnan*, from whom the impostor was descended in the *twenty-first* degree; and, although we have genealogies of *Alkamah* and other *Himyaric* bards as high as the *thirtieth* degree, or for a period of *nine hundred* years at least, yet we can hardly depend on them so far, as to establish a complete chronological system.

By reaſoning downwards, however, we may aſcertain ſome points of conſiderable importance. The univerſal tradition of *Yemen* is, That *Yoktan*, the ſon of *Eber*, firſt ſettled his family in the country; which ſettlement, by the computation admitted in *Europe*, muſt have been above *three thouſand ſix hundred* years ago, and nearly at the time when the *Hindus*, under the conduct of *Rama*, were ſubduing the firſt inhabitants of theſe regions, and extending the *Indian* empire from *Ayodhya* or *Audh*, as far as the iſle of *Sinhal*, or *Silan*. According to this calculation, *Nuuman*, king of *Yemen*, in the *ninth* generation from *Eber*, was contemporary with *Joſeph*; and, if a verſe compoſed by that prince, and quoted by *Abulfeda*, was really preſerved, as it might eaſily have been, by oral tradition, it proves the great antiquity of the *Arabian* language and metre. This is a literal verſion of the couplet: 'When thou, who art in power, conducteſt affairs with 'courteſy, thou attaineſt the high honours of thoſe 'who are moſt exalted, *and* whoſe mandates are 'obeyed.' We are told that, from an elegant verb in this diſtich, the royal poet acquired the ſurname of *Almuaaſer*, or the *Courteous*. Now the reaſons for believing this verſe genuine are its brevity, which made it eaſy to be remembered, and the good ſenſe comprized in it, which made it become proverbial; to which we may add, that the dialect is apparently old, and differs in three words from the idiom of *Hejaz*. The reaſons for doubting are, that ſentences and verſes of indefinite antiquity are ſometimes aſcribed by the *Arabs* to particular perſons of eminence; and they even go ſo far as to cite a pathetic elegy of *Adam* himſelf on the death of *Abel*, but in very good *Arabic* and correct meaſure. Such are the doubts which neceſſarily muſt ariſe on ſuch a ſubject; yet we have no need of ancient monuments or traditions to prove all that our analyſis requires, namely, that the *Arabs* of *Hejaz* and *Yemen* ſprang from a ſtock entirely differ-

ent from that of the *Hindus*, and that their first establishments in the respective countries where we now find them, were nearly coeval.

I cannot finish this article without observing, that, when the King of *Denmark*'s ministers instructed the *Danish* travellers to collect *historical* books in *Arabic*, but not to busy themselves with procuring *Arabian poems*, they certainly were ignorant that the only monuments of old *Arabian* history are collections of poetical pieces and the commentaries on them; that all memorable transactions in *Arabia* were recorded in verse; and that more certain facts may be known by reading the *Hamasah*, *the Diwan* of *Hudhail*, and the valuable work of *Obaidullah*, than by turning over a hundred volumes in prose, unless indeed those poems are cited by the historians as their authorities.

IV. The manners of the *Hejazi Arabs*, which have continued, we know, from the time of *Solomon* to the present age, were by no means favourable to the cultivation of *arts*; and, as to *sciences*, we have no reason to believe that they were acquainted with any; for the mere amusement of giving names to stars, which were useful to them in their pastoral or predatory rambles through the deserts, and in their observations on the weather, can hardly be considered as a material part of astronomy. The only arts in which they pretended to excellence (I except horsemanship and military accomplishments) were *poetry* and *rhetoric*. That we have none of their compositions in prose before the *Koran*, may be ascribed, perhaps, to the little skill which they seem to have had in writing, to their predilection in favour of poetical measure, and to the facility with which verses are committed to memory; but all their stories prove, that they were eloquent in a high degree, and possessed wonderful powers of speaking, without preparation, in flowing

and forcible periods. I have never been able to diſcover what was meant by their books called *Rawaſim*; but ſuppoſe that they were collections of their common or cuſtomary law. Writing was ſo little practiſed among them, that their old poems, which are now acceſſible to us, may almoſt be conſidered as originally unwritten; and I am inclined to think that *Samuel Johnſon*'s reaſoning on the extreme imperfection of unwritten languages, was too general; ſince a language that is only ſpoken, may neverthelefs be highly poliſhed by a people who, like the ancient *Arabs*, make the improvement of their idiom a national concern, appoint ſolemn aſſemblies for the purpoſe of diſplaying their poetical talents, and hold it a duty to exerciſe their children in getting by heart their moſt approved compoſitions.

The people of *Yemen* had poſſibly more *mechanical arts*, and, perhaps, more *ſcience*; but, although their ports muſt have been the emporia of conſiderable commerce between *Egypt* and *India*, or part of *Perſia*, yet we have no certain proofs of their proficiency in navigation, or even in manufactures. That the *Arabs* of the Deſert had muſical inſtruments, and names for the different notes, and that they were greatly delighted with melody, we know from themſelves; but their lutes and pipes were probably very ſimple, and their muſic, I ſuſpect, was little more than a natural and tuneful recitation of their elegiac verſes and love-ſongs. The ſingular property of their language, in ſhunning compound words, may be urged, according to *Bacon*'s idea, as a proof that they had made no progreſs in *arts*, 'which require,' ſays he, 'a variety 'of combinations to expreſs the complex notions ariſ-'ing from them;' but the ſingularity may perhaps be imputed wholly to the genius of the language, and the taſte of thoſe who ſpoke it, ſince the old *Germans* who knew no art, appear to have delighted in com-

pound words, which poetry and oratory, one would conceive, might require as much as any meaner art whatſoever.

So great, on the whole, was the ſtrength of parts or capacity, either natural or acquired from habit, for which the *Arabs* were ever diſtinguiſhed, that we cannot be ſurpriſed when we ſee that blaze of genius which they diſplayed, as far as their arms extended, when they burſt, like their own dyke of *Arim*, through their ancient limits, and ſpread, like an inundation, over the great empire of *Iran*. That a race of *Tazis* or *Courſers* as the *Perſians* call them, 'who drank 'the milk of camels and fed on lizards, ſhould enter-'tain a thought of ſubduing the kingdom of *Feridun*,' was conſidered by the General of *Yezdegird*'s army as the ſtrongeſt inſtance of fortune's levity and mutability; but *Firdauſi*, a complete maſter of *Aſiatic* manners, and ſingularly impartial, repreſents the *Arabs*, even in the age of *Feridun*, as 'diſclaiming any kind 'of dependence on that monarch, exulting in their 'liberty, delighting in eloquence, acts of liberality, and 'martial achievements; and thus making the whole 'earth,' ſays the poet, 'red as wine with the blood 'of their foes, and the air like a foreſt of canes with 'their tall ſpears.' With ſuch a character they were likely to conquer any country that they could invade; and, if *Alexander* had invaded their dominions, they would unqueſtionably have made an obſtinate, and probably a ſucceſsful reſiſtance.

But I have detained you too long, gentlemen, with a nation who have ever been my favourites, and hope at your next anniverſary meeting to travel with you over a part of *Aſia* which exhibits a race of men diſtinct both from *Hindus* and from the *Arabs*. In the mean time, it ſhall be my care to ſuperintend the publication of your tranſactions; in which if the learned

in *Europe* have not raiſed their expectations too high, they will not, I believe, be diſappointed: my own imperfect eſſays I always except; but, though my other engagements have prevented my attendance on your ſociety for the greateſt part of laſt year, and I have ſet an example of that freedom from reſtraint, without which no ſociety can flouriſh; yet, as my few hours of leiſure will now be devoted to *Sanſcrit* literature, I cannot but hope, though my chief object be a knowledge of *Hindu* law, to make ſome diſcovery in other ſciences, which I ſhall impart with humility, and which you will, I doubt not, receive with indulgence.

II.

THE FIFTH ANNIVERSARY DISCOURSE,

DELIVERED 21 FEBRUARY, 1788,

BY THE PRESIDENT.

AT the cloſe of my laſt addreſs to you, Gentlemen, I declared my deſign of introducing to your notice a people of *Aſia*, who ſeemed as different in moſt reſpects from the *Hindus* and *Arabs* as thoſe two nations had been ſhown to differ from each other; I mean the people whom we call *Tartars:* but I enter with extreme diffidence on my preſent ſubject, be cauſe I have little knowledge of the *Tartarean* dialects; and the groſs errors of *European* writers on *Aſiatic* literature, have long convinced me that no ſatisfactory account can be given of any nation with whoſe language we are not perfectly acquainted. Such evidence, however, as I have procured by attentive reading and ſcrupulous enquiries, I will now lay before you; interſperſing ſuch remarks as I could not but make on that evidence, and ſubmitting the whole to your impartial deciſion.

Conformably to the method before adopted in deſcribing *Arabia* and *India*, I conſider *Tartary* alſo, for the purpoſe of this diſcourſe, on its moſt extenſive ſcale; and requeſt your attention whilſt I trace the largeſt boundaries that are aſſignable to it. Conceive a line drawn from the mouth of the *Oby* to that of the

Dneiper, and, bringing it back eaſtward acroſs the *Euxine*, ſo as to include the peninſula of *Krim*, extend it along the foot of *Caucaſus*, by the rivers *Cur* and *Aras*, to the *Caſpian Lake*, from the oppoſite ſhore of which follow the courſe of the *Jaihun*, and the chain of *Caucaſean* hills, as far as thoſe of *Imaus*; whence continue the line beyond the *Chineſe* Wall to the White Mountain and the country of *Yetſo*; ſkirting the borders of *Perſia*, *India*, *China*, *Corea*, but including part of *Ruſsia*, with all the diſtricts which lie between the Glacial Sea and that of *Japan*. M. *de Guignes*, whoſe great work on the *Huns* abounds more in ſolid learning than in rhetorical ornaments, preſents us, however, with a magnificent image of this wide region; deſcribing it as a ſtupendous edifice, the beams and pillars of which are many ranges of lofty hills, and the dome one prodigious mountain, to which the *Chineſe* give the epithet of *Celeſtial*, with a conſiderable number of broad rivers flowing down its ſides. If the manſion be ſo amazingly ſublime, the land around it is proportionably extended, but more wonderfully diverſified; for ſome parts of it are encruſted with ice, others parched with inflamed air, and covered with a kind of lava: here we meet with immenſe tracks of ſandy deſerts, and foreſts almoſt impenetrable; there, with gardens, groves, and meadows, perfumed with muſk, watered by numberleſs rivulets, and abounding in fruits and flowers; and, from eaſt to weſt, lie many conſiderable provinces, which appear as valleys in compariſon of the hills towering above them, but in truth are the flat ſummits of the higheſt mountains in the world, or at leaſt the higheſt in *Aſia*. Near one-fourth in latitude of this extraordinary region is in the ſame charming climate with *Greece*, *Italy*, and *Provence*; and another fourth in that of *England*, *Germany*, and the northern parts of *France*; but the *Hyperborean* countries can have few beauties to recommend them, at leaſt in the preſent ſtate of the

earth's temperature. To the south, on the frontiers of *Iran* are the beautiful vales of *Soghd*, with the celebrated cities of *Samarkand* and *Bokhara*; on those of *Tibet* are the territories of *Cashagar*, *Khoten*, *Chegil*, and *Khata*, all famed for perfumes, and for the beauty of their inhabitants; and on those of *China* lies the country of *Chin*, anciently a powerful kingdom; which name, like that of *Khata*, has in modern times been given to the whole *Chinese* empire, where such an appellation would be thought an insult. We must not omit the fine territory of *Tancut*, which was known to the *Greeks* by the name of *Serica*, and considered by them as the farthest eastern extremity of the habitable globe.

Scythia seems to be the general name which the ancient *Europeans* gave to as much as they knew of the country thus bounded and described; but whether that word be derived, as *Pliny* seems to intimate, from *Sacai*, a people known by a similar name to the *Greeks* and *Persians*, or, as *Bryant* imagines, from *Cuthia*, or, as Colonel *Vallancey* believes, from words denoting *navigation*, or, as it might have been supposed, from a *Greek* root implying *wrath* and ferocity, this at least is certain, that, as *India*, *China*, *Persia*, *Japan*, are not appellations of those countries in the languages of the nations who inhabit them, so neither *Scythia* nor *Tartary* are names by which the inhabitants of the country now under our consideration, have ever distinguished themselves. *Tartaristan* is, indeed, a word used by the *Persians* for the south-western part of *Scythia*, where the musk-deer is said to be common; and the name *Tartar* is by some considered as that of a particular tribe; by others, as that of a small river only; while *Turan*, as opposed to *Iran*, seems to mean the ancient dominion of *Afrasia* to the north and east of the *Oxus*. There is nothing more idle than a debate concerning names, which, after all, are

of little conſequence when our ideas are diſtinct without them. Having given, therefore, a correct notion of the country which I propoſed to examine, I ſhall not ſcruple to call it by the general name of *Tartary*; though I am conſcious of uſing a term equally improper in the pronunciation and the application of it.

Tartary, then, which contained, according to *Pliny*, *an innumerable multitude of nations*, by whom the reſt of *Aſia* and *Europe* has in different ages been overrun, is denominated, as various images have preſented themſelves to various fancies, the *great hive of the northern ſwarms*, the *nurſery of irreſiſtible legions*, and by ſtronger metaphor, the *foundery of the human race*; but M. *Bailly*, a wonderfully ingenious man and a very lively writer, ſeems firſt to have conſidered it as the *cradle of our ſpecies*, and to have ſupported an opinion that the whole ancient world was enlightened by ſciences brought from the moſt northern parts of *Scythia*, particularly from the banks of the *Jeniſea*, or from the *Hyperborean* regions. All the fables of old *Greece*, *Italy*, *Perſia*, *India*, he derives from the north; and it muſt be owned, that he maintains his paradox with acuteneſs and learning. Great learning and great acuteneſs, together with the charms of a moſt engaging ſtyle, were indeed neceſſary to render even tolerable a ſyſtem which places an earthly paradiſe, the gardens of *Heſperus*, the iſlands of the *Macares*, the groves of *Elyſium*, if not of *Eden*, the heaven of *Indra*, the *Periſtan*, or fairy-land of the *Perſian* poets, with its city of diamonds and its country of *Shadeam*, ſo named from *Pleaſure* and *Love*, not in any one climate which the common ſenſe of mankind conſiders as the ſeat of delights, but beyond the mouth of the *Oby*, in the Frozen Sea, in a region equalled only by that where the wild imagination of *Dante* led him to fix the worſt of criminals in a ſtate of puniſhment after

death, and of which *he could not*, he ſays, *even think without ſhivering*. A very curious paſſage in a tract of *Plutarch* on *the figure in the moon's orb*, naturally induced M. *Bailly* to place *Ogygia* in the north; and he concludes that iſland, as others have concluded rather fallaciouſly, to be the *Atlantis* of *Plato*; but is at a loſs to determine whether it was *Iceland* or *Greenland*, *Spitzbergen* or *New Zembla*. Among ſo many charms it was difficult, indeed, to give a preference; but our philoſopher, though as much perplexed by an option of beauties as the ſhepherd of *Ida*, ſeems on the whole to think *Zembla* the moſt worthy of the *golden fruit*; becauſe it is indiſputably an iſland, and lies oppoſite to a gulph near a continent, from which a great number of rivers deſcend into the ocean. He appears equally diſtreſſed among five nations, real and imaginary, to fix upon that which the *Greeks* named *Atlantes*; and his concluſion in both caſes muſt remind us of the ſhowman at *Eton*, who, having pointed out in his box all the crowned heads of the world, and being aſked by the ſchool-boys who looked through the glaſs, which was the Emperor, which was the Pope, which the Sultan, and which the Great Mogul, anſwered eagerly, 'Which you pleaſe, young gentlemen, which you pleaſe.' His letters, however, to *Voltaire*, in which he unfolds his new ſyſtem to his friend, whom he had not been able to convince, are by no means to be derided; and his general propoſition, that arts and ſciences had their ſource in *Tartary*, deſerves a longer examination than can be given to it in this diſcourſe. I ſhall, nevertheleſs, with your permiſſion, ſhortly diſcuſs the queſtion under the ſeveral heads, that will preſent themſelves in order.

Although we may naturally ſuppoſe that the numberleſs communities of *Tartars*, ſome of whom are eſtabliſhed in great cities, and ſome encamped

on plains in ambulatory manſions, which they remove from paſture to paſture, muſt be as different in their features as in their dialects; yet, among thoſe who have not emigrated into another country, and mixed with another nation, we may diſcern a family-likeneſs, eſpecially in their eyes and countenance, and in that configuration of lineaments which we generally call a *Tartar face*; but, without making anxious enquiries, whether all the inhabitants of the vaſt region before deſcribed have ſimilar features, we may conclude from thoſe whom we have ſeen, and from the original portraits of *Taimur* and his deſcendants, that the *Tartars* in general differ wholly in complexion and countenance from the *Hindus* and from the *Arabs*: an obſervation which tends, in ſome degree, to confirm the account given by modern *Tartars* themſelves of their deſcent from a common anceſtor. Unhappily, their lineage cannot be proved by authentic pedigrees, or hiſtorical monuments; for all their writings extant, even thoſe in the *Mogul* dialect, are long ſubſequent to the time of *Muhammed*; nor is it poſſible to diſtinguiſh their genuine traditions from thoſe of the *Arabs*, whoſe religious opinions they have in general adopted. At the beginning of the *fourteenth* century, *Khwajah Raſhid*, ſurnamed *Fadlullah*, a native of *Kazvin*, compiled his account of the *Tartars* and *Mongals* from the papers of one *Pulad*, whom the great-grandſon of *Holacu* had ſent into *Tartariſtan* for the ſole purpoſe of collecting hiſtorical information; and the commiſſion itſelf ſhows how little the *Tartarian* princes really knew of their own origin. From this work of *Raſhid*, and from other materials, *Abulghazi*, king of *Khwarezm*, compoſed in the *Mogul* language his *Genealogical Hiſtory*, which, having been purchaſed from a merchant of *Bokhara* by ſome *Swediſh* officers, priſoners of war in *Siberia*, has found its way into ſeveral *European* tongues: it contains much valuable matter, but, like

all *Muhammedan* hiſtories, exhibits tribes or nations as individual ſovereigns; and, if Baron *De Tott* had not ſtrangely neglected to procure a copy of the *Tartarian* hiſtory, for the original of which he unneceſſarily offered a large ſum, we ſhould probably have found that it begins with an account of the deluge, taken from the *Koran*, and proceeds to rank *Turc*, *Chin*, *Tatar*, and *Mongal*, among the ſons of *Yafet*. The genuine traditional hiſtory of the *Tartars*, in all the books that I have inſpected, ſeems to begin with *Oghuz*, as that of the *Hindus* does with *Rama:* they place their miraculous hero and patriarch *four thouſand* years before *Chengiz Khan*, who was born in the year 1164, and with whoſe reign their hiſtorical period commences. It is rather ſurprizing that Mr. *Bailly*, who makes frequent appeals to etymological arguments, has not derived *Ogyges* from *Oghuz*, and *Atlas* from *Atlai*, or the *Golden Mountain* of *Tartary:* the *Greek* terminations might have been rejected from both words; and a mere tranſpoſition of letters is no difficulty with an etymologiſt.

My remarks in this addreſs, Gentlemen, will be confined to the period preceding *Chengiz*; and, although the learned labours of M. *de Guignes*, and the Fathers *Visdelou*, *Demailla*, and *Gaubil*, who have made an incomparable uſe of their *Chineſe* literature, exhibit probable accounts of the *Tartars* from a very early age; yet the old hiſtorians of *China* were not only foreign, but generally hoſtile to them, and for both thoſe reaſons, either through ignorance or malignity, may be ſuſpected of miſrepreſenting their tranſactions: if they ſpeak truth, the ancient hiſtory of the *Tartars* preſents us, like moſt other hiſtories, with a ſeries of aſſaſſinations, plots, treaſons, maſſacres, and all the natural fruits of ſelfiſh ambition. I ſhould have no inclination to give you a ſketch of ſuch horrors, even if the oc-

casion called for it; and will barely obferve, that the firft king of the *Hyumnus*, or *Huns*, began his reign, according to *Visdelou*, about *three thoufand five hundred and fixty years ago*, not long after the time fixed in my former difcourfes for the firft regular eftablifhments of the *Hindus* and *Arabs* in their feveral countries.

I. Our firft enquiry concerning the *languages* and *letters* of the *Tartars*, prefents us with a deplorable void, or with a profpect as barren and dreary as that of their deferts. The *Tartars*, in general, had no literature (in this point all authorities appear to concur); the *Turcs* had no letters; the *Huns*, according to *Procopius*, had not even heard of them; the magnificent *Chengiz*, whofe empire included an area of near eighty fquare degrees, could find none of his own *Mongals*, as the beft authors inform us, able to write his difpatches; and *Taimur*, a favage of ftrong natural parts, and paffionately fond of hearing hiftories read to him, could himfelf neither write nor read. It is true that *Ibnu Arabfhah* mentions a fet of characters called *Dilberjin*, which were ufed in *Khata*: 'he had feen them,' he fays, 'and found them to 'confift of *forty-one* letters, a diftinct fymbol being 'appropriated to each long and fhort vowel, and 'to each confonant hard or foft, or otherwife varied 'in pronunciation;' but *Khata* was in Southern *Tartary*, on the confines of *India*; and, from his defcription of the characters there in ufe, we cannot but fufpect them to have been thofe of *Tibet*, which are manifeftly *Indian*, bearing a greater refemblance to thofe of *Bengal* than to *Devanagari*. The learned and eloquent *Arab* adds, 'that the *Tartars* of *Khata* 'write, in the *Dilberjin* letters, all their tales and 'hiftories, their journals, poems, and mifcellanies, 'their diplomas, records of ftate and juftice, the laws 'of *Chengiz*, their public regifters, and their compofi-

'tions of every ſpecies.' If this be true, the people of *Khata* muſt have been a poliſhed, and even a lettered nation; and it may be true, without affecting the *general* poſition, that the *Tartars* were illiterate; but *Ibnu Arabſhah* was a profeſſed rhetorician, and it is impoſſible to read the original paſſage without full conviction that his object in writing it was to diſplay his power of words in a flowing and modulated period. He ſays further, that in *Jaghatai*, the people of *Oighur*, as he calls them, 'have a ſyſtem of *fourteen* 'letters only, denominated, from themſelves, *Oighuri*;' and thoſe are the characters which the *Mongals* are ſuppoſed, by moſt authors, to have borrowed. *Abulghazi* tells us only, that *Chengiz* employed the natives of *Eighur* as excellent penmen; but the *Chineſe* aſſert, that he was forced to employ them, becauſe he had no writers at all among his natural-born ſubjects; and we are aſſured by many, that *Kublaikhan* ordered letters to be invented for his nation by a *Tibetian*, whom he rewarded with the dignity of chief *Lama*. The ſmall number of *Eighuri* letters might induce us to believe that they were *Zend* or *Pahlavi*, which muſt have been current in that country when it was governed by the ſons of *Feridun*; and, if the alphabet aſcribed to the *Eighurians* by M. *Des Hauteſrayes* be correct, we may ſafely decide, that in many of its letters it reſembles both the *Zend* and the *Syriac*, with a remarkable difference in the mode of connecting them; but, as we can ſcarce hope to ſee a genuine ſpecimen of them, our doubt muſt remain in regard to their form and origin. The page exhibited by *Hyde* as *Khatayan* writing, is evidently a ſort of broken *Cufick*; and the fine manuſcript at *Oxford*, from which it was taken, is more probably a *Mendean* work on ſome religious ſubject, than, as he imagined, a code of *Tartarian* laws. That very learned man appears to have made a worſe miſtake, in giving us for *Mongal* characters a page of writing which has the appearance of *Japaneſe*, or mutilated *Chineſe* letters.

If the *Tartars* in general, as we have every reason to believe, had no written memorials, it cannot be thought wonderful that their *languages*, like those of *America*, should have been in perpetual fluctuation, and that more than fifty dialects, as *Hyde* had been credibly informed, should be spoken between *Moscow* and *China*, by the many kindred tribes or their several branches, which are enumerated by *Abulghazi*. What those dialects are, and whether they really sprang from a common stock, we shall probably learn from Mr. *Pallas*, and other indefatigable men employed by the *Russian* court; and it is from the *Russians* that we must expect the most accurate information concerning the *Asiatic* subjects: I persuade myself that, if their enquiries be judiciously made and faithfully reported, the result of them will prove that all the languages properly *Tartarian*, arose from one common source; excepting always the jargons of such wanderers or mountaineers as, having long been divided from the main body of the nation, must, in a course of ages, have framed separate idioms for themselves. The only *Tartarian* language of which I have any knowledge, is the *Turkish* of *Constantinople*, which is however so copious, that whoever shall know it perfectly, will easily understand, as we are assured by intelligent authors, the dialects of *Tartaristan*; and we may collect from *Abulghazi*, that he would find little difficulty in the *Calmac* and the *Mogul*. I will not offend your ears by a dry catalogue of similar words in those different languages; but a careful investigation has convinced me that, as the *Indian* and *Arabian* tongues are severally descended from a common parent, so those of *Tartary* might be traced to one ancient stem, essentially differing from the two others. It appears, indeed, from a story told by *Abulghazi*, that the *Virats* and the *Mongals* could not understand each other; but no more can the *Danes* and the *English*, yet their dialects, beyond a doubt, are branches of

the ſame *Gothic* tree. The dialect of the *Moguls*, in which ſome hiſtories of *Taimur* and his deſcendants were originally compoſed, is called in *India*, where a learned native ſet me right when I uſed another word, *Turci*; not that it is preciſely the ſame with the *Turkiſh* of the *Othmanlus*, but the two idioms differ, perhaps, leſs than *Swediſh* and *German*, or *Spaniſh* and *Portugueſe*, and certainly leſs than *Welſh* and *Iriſh*. In hope of aſcertaining this point, I have long ſearched in vain for the original works aſcribed to *Taimur* and *Baber*; but all the *Moguls* with whom I have converſed in this country, reſemble the crow in one of their popular fables, who, having long affected to walk like a pheaſant, was unable, after all, to acquire the gracefulneſs of that elegant bird, and in the mean time forgot his own natural gait. They have not learned the dialect of *Perſia*, but have wholly forgotten that of their anceſtors. A very conſiderable part of the old *Tartarian* language, which in *Aſia* would probably have been loſt, is happily preſerved in *Europe*; and, if the ground-work of the weſtern *Turkiſh*, when ſeparated from the *Perſian* and *Arabic*, with which it is embelliſhed, be a branch of the loſt *Oghuzian* tongue, I can aſſert with confidence that it has not the leaſt reſemblance either to *Arabic* or *Sanſcrit*, and muſt have been invented by a race of men wholly diſtinct from the *Arabs* or *Hindus*. This fact alone overſets the ſyſtem of M. *Bailly*, who conſiders the *Sanſcrit*, of which he gives in ſeveral places a moſt erroneous account, as '*A fine monument of his primeval* Scythians, *the preceptors of mankind, and planters of a ſublime philoſophy even in* India;' for he holds it an inconteſtable truth, that *a language which is dead, ſuppoſes a nation which is deſtroyed*; and he ſeems to think ſuch reaſoning perfectly deciſive of the queſtion, without having recourſe to aſtronomical arguments, or the ſpirit of ancient inſtitutions. For my part, I deſire no better proof than that which the

language of the *Brahmans* affords, of an immemorial and total difference between the *ſavages of the mountains*, as the old *Chineſe* juſtly called the *Tartars*, and the ſtudious, placid, contemplative inhabitants of theſe *Indian* plains.

II. The *geographical* reaſoning of M. *Bailly* may, perhaps, be thought equally ſhallow, if not inconſiſtent in ſome degree with itſelf. 'An adoration of the 'ſun and of fire,' ſays he, 'muſt neceſſarily have 'ariſen in a cold region; therefore it muſt have been 'foreign to *India*, *Perſia*, *Arabia*; therefore it muſt 'have been derived from *Tartary*.' No man, I believe, who has travelled in winter through *Bahar*, or has even paſſed a cold ſeaſon at *Calcutta* within the tropic, can doubt that the ſolar warmth is often deſirable by all, and might have been conſidered as adorable by the ignorant in theſe climates; or that the return of ſpring deſerves all the ſalutations which it receives from the *Perſian* and *Indian* poets; not to rely on certain hiſtorical evidence, that *Antarah*, a celebrated warrior and bard, actually periſhed with cold on a mountain of *Arabia*. To meet, however, an objection which might naturally enough be made to the voluntary ſettlement and amazing population of his primitive race, in the icy regions of the north, he takes refuge in the hypotheſis of M. *Buffon*, who imagines that our whole globe was at firſt of a white heat, and has been gradually cooling from the poles of the equator; ſo that the *Hyperborean* countries had once a delightful temperature; and *Siberia* itſelf was *hotter than the climate of our temperate zones*; that is, was in too hot a climate, by his firſt propoſition, for the primary worſhip of the ſun. That the temperature of countries has not ſuſtained a change in the lapſe of ages, I will by no means inſiſt; but we can hardly reaſon concluſively from a variation of temperature to the cultivation and diffuſion of ſcience. If as many female elephants and tigreſſes as we now find in

Bengal had formerly littered in the *Siberian* foreſts, and the young, as the earth cooled, had ſought a genial warmth in the climate of the ſouth, it would not follow that other ſavages, who migrated in the ſame direction, and on the ſame account, brought religion and philoſophy, language and writing, art and ſcience, into the ſouthern latitudes.

We are told by *Abulghazi* that the primitive religion of human creatures, or the pure adoration of one Creator, prevailed in *Tartary* during the firſt generations of *Yafet*, but was extinct before the birth of *Oghuz*, who reſtored it in his dominions; that, ſome ages after him, the *Mongals* and the *Turcs* relapſed into groſs idolatry; but that *Chengiz* was a Theiſt, and, in a converſation with the *Muhammedan* doctors, admitted their arguments for the being and attributes of the Deity to be unanſwerable, while he conteſted the evidence of their prophet's legation. From old *Grecian* authorities we learn that the *Maſſagetæ* worſhipped the ſun; and the narrative of an embaſſy from *Juſtin* to the *Rhaken*, or emperor, who then reſided in a fine vale near the ſource of the *Irtiſh*, mentions the *Tartarian* ceremony of purifying the *Roman* ambaſſadors by conducting them between two *fires*. The *Tartars* of that age are repreſented as adorers of the *four elements*, and believers in an inviſible ſpirit, to whom they ſacrificed bulls and rams. Modern travellers relate, that, in the feſtivals of ſome *Tartarian* tribes, they pour a few drops of a conſecrated liquor on the ſtatues of their gods; after which an attendant ſprinkles a little of what remains three times toward the ſouth, in honour of fire; toward the weſt and eaſt, in honour of water and air; and as often toward the north, in honour of the earth, which contained the reliques of their deceaſed anceſtors. Now all this may be very true, without proving a national affinity between the *Tartars*

and *Hindus*; for the *Arabs* adored the planets and the beauties of Nature; the *Arabs* had carved images, and made libations on a black ftone; the *Arabs* turned in prayer to different quarters of the heavens; yet we know with certainty, that the *Arabs* are a diftinct race from the *Tartars*; and we might as well infer that they were the fame people, becaufe they had each their *Nomades, or wanderers for pafture*; and becaufe the *Turcmans*, defcribed by *Ibnuarabfhah*, and by him called *Tartars*, are, like *moft Arabian* tribes, paftoral and warlike, hofpitable and generous, wintering and fummering on different plains, and rich in herds and flocks, horfes and camels: but this agreement in manners proceeds from the fimilar nature of their feveral deferts, and their fimilar choice of a free rambling life, without evincing a community of origin, which they could fcarce have had without preferving fome remnant at leaft of a common language.

Many *Lamas*, we are affured, or priefts of *Buddha*, have been found fettled in *Siberia*; but it can hardly be doubted that the *Lamas* had travelled thither from *Tibet*; whence it is more than probable, that the religion of the *Bauddhas* was imported into Southern, or *Chinefe Tartary*; fince we know that rolls of *Tibetian* writing have been brought even from the borders of the *Cafpian*. The complexion of *Cuddha* himfelf, which, according to the *Hindus*, was *between white and ruddy*, would perhaps have convinced M. *Bailly*, had he known the *Indian* tradition, that the laft great legiflator and god of the eaft was a *Tartar*; but the *Chinefe* confider him as a native of *India*; the *Brahmans* infift that he was born in a foreft near *Gaya*; and many reafons may lead us to fufpect, that his religion was carried from the weft and the fouth, to thofe eaftern and northern countries in which it prevails. On the whole, we meet

with few or no traces in *Scythia* of *Indian* rites and ſuperſtitions, or of that poetical mythology with which the *Sanſcrit* poems are decorated; and we may allow the *Tartars* to have adored the Sun with more reaſon than any ſouthern people, without admitting them to have been the ſole original inventors of that univerſal folly. We may even doubt the originality of their veneration for the *four elements*, which forms a principal part of the ritual introduced by *Zeratuſht*, a native of *Rai* in *Perſia*, born in the reign of *Guſhtaſp*, whoſe ſon *Pashuten* is believed by the *Parſis* to have reſided long in *Tartary*, at a place called *Cangidiz*, where a magnificent palace is ſaid to have been built by the father of *Cyrus*, and where the *Perſian* prince, who was a zealot in the new faith, would naturally have diſſeminated its tenets among the neighbouring *Tartars*.

Of any philoſophy, except natural ethics, which the rudeſt ſociety requires and experience teaches, we find no more veſtiges in *Aſiatic Scythia* than in ancient *Arabia*; nor would the name of a philoſopher and a *Scythian* have ever been connected, if *Anacharſis* had not viſited *Athens* and *Lydia* for that inſtruction, which his birth-place could not have afforded him: but *Anacharſis* was the ſon of a *Grecian* woman, who had taught him her language; and he ſoon learned to deſpiſe his own. He was unqueſtionably a man of a ſound underſtanding and fine parts; and, among the lively ſayings which gained him the reputation of a wit even in *Greece*, it is related by *Diogenes Laertius*, that, when an *Athenian* reproached him with being a *Scythian*, he anſwered, ‘My country is, indeed, a diſ‘grace to me; but thou art a diſgrace to thy country.’ What his country was, in regard to manners and civil duties, we may learn from his fate in it; for when, on his return from *Athens*, he attempted to reform it by introducing the wiſe laws of his friend *Solon*, he was

killed on a hunting party with an arrow, ſhot by his own brother, a *Scythian* chieftain. Such was the philoſophy of M. *Bailly*'s *Atlantes*, the firſt and moſt enlightened of nations! We are aſſured, however, by the learned author of the *Dabiſtan*, that the *Tartars* under *Chengiz*, and his deſcendants, were lovers of truth, and would not even preſerve their lives by a violation of it. *De Guignes* aſcribes the ſame veracity, the parent of all virtues, to the *Huns*; and *Strabo*, who might only mean to laſh the *Greeks* by praiſing Barbarians, as *Horace* extolled the wandering *Scythians* merely to ſatirize his luxurious countrymen, informs us that the nations of *Scythia* deſerve the praiſe due to wiſdom, heroic friendſhip, and juſtice; and this praiſe we may readily allow them on his authority, without ſuppoſing them to have been the preceptors of mankind.

As to the laws of *Zamolxis*, concerning whom we know as little as of the *Scythian Deucalion*, or of *Abaris* the *Hyperborean*, and to whoſe ſtory even *Herodotus* gave no credit, I lament, for many reaſons, that if ever they exiſted they have not been preſerved. It is certain that a ſyſtem of laws, called *Yaſac*, has been celebrated in *Tartary* ſince the time of *Chengiz*, who is ſaid to have republiſhed them in his empire, as his inſtitutions were afterwards adopted and enforced by *Taimur*; but they ſeem to have been a common or traditionary law, and were probably not reduced into writing till *Chengiz* had conquered a nation who were able to write.

III. Had the religious opinions and allegorical fables of the *Hindus* been actually borrowed from *Scythia*, travellers muſt have diſcovered in that country ſome ancient monuments of them; ſuch as pieces of groteſque ſculpture, images of the Gods and *Avatars*,

and inſcriptions on pillars or in caverns, analogous to thoſe which remain in every part of the weſtern peninſula, or to thoſe which many of us have ſeen in *Bahar* and at *Banares*; but (except a few detached idols) the only great monuments of *Tartarian* antiquity are in a line of ramparts on the weſt and eaſt of the *Caſpian*, aſcribed indeed by ignorant *Muſelmans* to *Yajuj* and *Majuj*, or *Gog* and *Magog*; that is, to the *Scythians*, but manifeſtly raiſed by a very different nation, in order to ſtop their predatory inroads through the paſſes of *Caucaſus*. The *Chineſe* wall was built, or finiſhed, on a ſimilar conſtruction and for a ſimilar purpoſe, by an emperor, who died only two hundred and ten years before the beginning of our æra; and the other mounds were very probably conſtructed by the old *Perſians*, though, like many works of unknown origin, they are given to *Secander*, not the *Macedonian*, but a more ancient hero, ſuppoſed by ſome to have been *Jemshid*. It is related, that pyramids and tombs have been found in *Tatariſtan*, or *Weſtern Scythia*, and ſome remnants of edifices in the lake *Saiſon*; that veſtiges of a deſerted city have been recently diſcovered by the *Ruſſians* near the *Caſpian* Sea, and the *Mountain of Eagles*; and that golden ornaments and utenſils, figures of elks and other quadrupeds in metal, weapons of various kinds, and even implements for mining, but made of copper inſtead of iron, have been dug up in the country of the *Tſhudes*; whence M. *Bailly* infers, with great reaſon, the high antiquity of that people: but the high antiquity of the *Tartars*, and their eſtabliſhment in that country near four thouſand years ago, no man diſputes; we are inquiring into their ancient religion and philoſophy; which neither ornaments of gold nor tools of copper will prove to have had an affinity with the religious rites and the ſciences of *India*. The golden utenſils might poſſibly have been fabricated by the *Tartars*

themſelves; but it is poſſible too, that they were carried from *Rome* or from *China*, whence occaſional embaſſies were ſent to the kings of *Eighur*. Towards the end of the tenth century the *Chineſe* emperor diſpatched an ambaſſador to a prince, named *Erſlan*, which, in the *Turkiſh* of *Conſtantinople*, ſignifies a *lion*, who reſided near the *Golden Mountain*; in the ſame ſtation, perhaps, where the *Romans* had been received in the middle of the ſixth century. The *Chineſe* on his return home reported the *Eighuris* to be a grave people, with fair complexions, diligent workmen, and ingenious artificers not only in gold, ſilver, and iron, but in jaſper and fine ſtones; and the *Romans* had before deſcribed their magnificent reception in a rich palace adorned with *Chineſe* manufactures: but theſe times were comparatively modern; and, even if we ſhould admit that the *Eighuris*, who are ſaid to have been governed for a period of two thouſand years by an *Idecut*, or ſovereign, of their own race, were in ſome very early age a literary and poliſhed nation, it would prove nothing in favour of the *Huns*, *Turcs*, *Mongals*, and other ſavages to the north of *Pekin*, who ſeem in all ages before *Muhammed*, to have been equally ferocious and illiterate.

Without actual inſpection of the manuſcripts that have been found near the *Caſpian*, it would be impoſſible to give a correct opinion concerning them; but one of them, deſcribed as written on blue ſilky paper in letters of gold and ſilver, not unlike *Hebrew*, was probably a *Tibetian* compoſition of the ſame kind with that of which lay near the ſource of the *Irtiſh*, and of which *Caſsiano*, I believe, made the firſt accurate verſion. Another, if we may judge from the deſcription of it, was probably modern *Turkiſh*; and none of them could have been of great antiquity.

IV. From ancient monuments, therefore, we have

no proof that the *Tartars* were themſelves well-inſtructed, much leſs that they inſtructed the world; nor have we any ſtronger reaſon to conclude from their general manners and character, that they had made an early proficiency in *arts* and *ſciences*. Even of poetry, the moſt univerſal and moſt natural of the fine arts, we find no genuine ſpecimens aſcribed to them, except ſome horrible war-ſongs expreſſed in *Perſian* by *Ali* of *Yezd*, and poſſibly invented by him. After the conqueſt of *Perſia* by the *Mongals*, their princes indeed encouraged learning, and even made aſtronomical obſervations at *Samarkand*; as the *Turc* became poliſhed by mixing with the *Perſians* and *Arabs*, though *their very nature*, as one of their own writers confeſſes, *had before been like an incurable diſtemper, and their minds clouded with ignorance:* thus alſo the *Mancheu* monarchs of *China* have been patrons of the learned and ingenious; and the Emperor *Kien Long* is, if he be now living, a fine *Chineſe* poet. In all theſe inſtances the *Tartars* have reſembled the *Romans*, who, before they had ſubdued *Greece*, were little better than tigers in war, and *fawns* or *ſylvans* in ſcience and art.

Before I left *Europe*, I had inſiſted in converſation, that the *Tuzuc*, tranſlated by Major *Davy*, was never written by *Taimur* himſelf, at leaſt not as *Cæſar* wrote his Commentaries, for one very plain reaſon, that no *Tartarian* king of his age could write at all; and, in ſupport of my opinion, I had cited *Ibnu Arabſhah*, who, though juſtly hoſtile to the ſavage by whom his native city, *Damaſcus*, had been ruined, yet praiſes his talents and the real greatneſs of his mind; but adds, "He was wholly illiterate; he neither red nor wrote "any thing; and he knew nothing of *Arabic*; "though of *Perſian*, *Turkiſh*, and the *Mogul* dialect, "he knew as much as was ſufficient for his purpoſe, "and no more. He uſed with pleaſure to hear hiſtories

" read to him, and ſo frequently heard the ſame book,
" that he was able by memory to correct an inaccurate
" reader." This paſſage had no effect on the tranſlator, whom *great and learned men in* India *had aſſured*, it ſeems, *that the work was authentic*, by which he meant *compoſed by the conqueror himſelf*: but the *great* in this country might have been *unlearned*, or the *learned* might not have been *great* enough to anſwer any leading queſtion in a manner that oppoſed the declared inclination of a *Britiſh* inquirer; and, in either caſe, ſince no witneſſes are named, ſo general a reference to them will hardly be thought concluſive evidence. On my part, I will name a *Muſelman*, whom we all know, and who has enough both of *greatneſs* and of *learning* to decide the queſtion both impartially and ſatisfactorily: The *Nawwab Mozaffer Jang* informed me of his own accord, that no man of ſenſe in *Hinduſtan* believed the work to have been compoſed by *Taimur*, but that his favourite, ſurnamed *Hindu Shah*, was known to have written that book and others, aſcribed to his patron, after many confidential diſcourſes with the *Emir*, and perhaps nearly in the prince's words as well as in his perſon: a ſtory which *Ali* of *Yezd*, who attained the court of *Taimur*, and has given us a flowery panegyric inſtead of hiſtory, renders highly probable, by confirming the latter part of the *Arabian* account, and by a total ſilence as to the literary productions of his maſter. It is true, that a very ingenious but indigent native, whom *Davy* ſupported, has given me a written memorial on the ſubject, in which he mentions *Taimur* as the author of two works in *Turkiſh*; but the credit of his information is overſet by a ſtrange apocryphal ſtory of a king of *Yemen*, who invaded, he ſays, the *Emir*'s dominions, and in whoſe library the manuſcript was afterwards found, and tranſlated by order of *Aliſhir*, firſt miniſter of *Taimur*'s grandſon; and Major *Davy* him-

ſelf, before he departed from *Bengal*, told me, that he was greatly perplexed by finding in a very accurate and old copy of the *Tuzuc*, which he deſigned to republiſh with conſiderable additions, a particular account, written *unqueſtionably* by *Taimur*, of *his own death*. No evidence, therefore, has been adduced to ſhake my opinion, that the *Moguls* and *Tartars*, before their conqueſt of *India* and *Perſia*, were wholly unlettered; although it may be poſſible that, even without art or ſcience, they had, like the *Huns*, both warriors and lawgivers in their own country ſome centuries before the birth of *Chriſt*.

If learning was ever anciently cultivated in the region to the north of *India*, the ſeats of it, I have reaſon to ſuſpect muſt have been *Eighur*, *Caſhghar*, *Khata*, *Chin*, *Tancut*, and other countries of *Chineſe Tartary*, which lie between the thirty-fifth and forty-fifth degrees of northern latitude; but I ſhall, in another diſcourſe, produce my reaſons for ſuppoſing that thoſe very countries were peopled by a race allied to the *Hindus*, or enlightened at leaſt by their vicinity to *India* and *China*; yet in *Tancut*, which by ſome is annexed to *Tibet*, and even among its old inhabitants, the *Seres*, we have no certain accounts of uncommon talents or great improvements: they were famed, indeed, for the faithful diſcharge of moral duties, for a pacific diſpoſition, and for that longevity which is often the reward of patient virtues and a calm temper; but they are ſaid to have been wholly indifferent in former ages to the elegant arts, and even to commerce; though *Fadlu'llah* had been informed, that near the cloſe of the *thirteenth* century many branches of natural philoſophy were cultivated in *Cam cheu*, then the metropolis of *Serica*.

We may readily believe thoſe, who aſſure us, that

ſome tribes of wandering *Tartars* had real ſkill in applying herbs and minerals to the purpoſe of medicine, and pretended to ſkill in magic; but the general character of their nation ſeems to have been this: They were profeſſed hunters or fiſhers, dwelling on that account in foreſts or near great rivers, under huts or rude tents, or in waggons drawn by their cattle from ſtation to ſtation; they were dexterous archers, excellent horſeman, bold combatants, appearing often to flee in diſorder for the ſake of renewing their attack with advantages; drinking the milk of mares, and eating the fleſh of colts; and thus in many reſpects reſembing the old *Arabs*, but in nothing more than in their love of intoxicating liquors, and in nothing leſs than in a taſte for poetry and the improvement of their language.

Thus has it been proved, and, in my humble opinion, beyond controverſy, that the far greater part of *Aſia* has been peopled and immemorially poſſeſſed by three conſiderable nations, whom, for want of better names, we may call *Hindus*, *Arabs*, and *Tartars*: each of them divided and ſubdivided into an infinite number of branches, and all of them ſo different in form and features, language, manners, and religion, that, if they ſprang originally from a common root, they muſt have been ſeparated for ages. Whether more than three primitive ſtocks can be found, or, in other words, whether the *Chineſe*, *Japaneſe*, and *Perſians*, are entirely diſtinct from them, or formed by their intermixture, I ſhall hereafter, if your indulgence to me continue, diligently inquire. To what concluſions theſe inquiries will lead, I cannot yet clearly diſcern; but, if they lead to truth, we ſhall not regret our journey through this dark region of ancient hiſtory, in which, while we proceed ſtep by ſtep, and follow every glimmering of certain light that preſents itſelf,

we muſt beware of thoſe falſe rays and luminous vapours which miſlead *Aſiatic* travellers, by an appearance of water, but are found on a near approach to be deſerts of ſand.

III.

THE SIXTH DISCOURSE:

ON THE *PERSIANS.*

DELIVERED 19 FEBRUARY, 1789.

Gentlemen,

I TURN with delight from the vaſt mountains and barren deſerts of *Turan*, over which we travelled laſt year with no perfect knowledge of our courſe, and requeſt you now to accompany me on a literary journey through one of the moſt celebrated and moſt beautiful countries in the world: a country, the hiſtory and languages of which, both ancient and modern, I have long attentively ſtudied, and on which I may without arrogance promiſe you more poſitive information than I could poſſibly procure on a nation ſo diſunited and ſo unlettered as the *Tartars:* I mean that which *Europeans* improperly call *Perſia*, the name of a ſingle province being applied to the whole empire of *Iran*, as it is correctly denominated by the preſent natives of it, and by the learned *Muſelmans* who reſide in theſe *Britiſh* territories. To give you an account of its largeſt boundaries, agreeably to my former mode of deſcribing *India*, *Arabia*, and

Tartary, between which it lies, let us begin with the ſource of the great *Aſſyrian* ſtream *Euphrates* (as the *Greeks*, according to their cuſtom, were pleaſed to miſcall the *Forat*). and thence deſcend to its mouth in the Green Sea, or *Perſian* Gulf, including in our line ſome conſiderable diſtricts and towns on both ſides of the river; then, coaſting *Perſia*, properly ſo named, and other *Iranian* provinces, we come to the Delta of the *Sindhu* or *Indus*; whence aſcending to the mountains of *Caſhghar*, we diſcover its fountains and thoſe of the *Jaihun*, down which we are conducted to the *Caſpian*, which formerly perhaps it entered, though it loſes itſelf now in the ſands and lakes of *Khwarezn*. We next are led from the Sea of *Khozar*, by the banks of the *Cur*, or *Cyrus*, and along the *Caucaſean* ridges to the ſhore of the *Euxine*, and thence by the ſeveral *Grecian* Seas to the point whence we took our departure, at no conſiderable diſtance from the *Mediterranean*. We cannot but include the *Lower Aſia* within this outline, becauſe it was unqueſtionably a part of the *Perſian*, if not of the old *Aſſyrian* empire; for we know that it was under the dominion of *Caikhoſrau*; and *Diodorus*, we find, aſſerts, that the kingdom of *Troas* was dependent on *Aſſyria*, ſince *Priam* implored and obtained ſuccours from his emperor *Teutames*, whoſe name approaches nearer to *Tahmuras* than to that of any other *Aſſyrian* monarch. Thus may we look on *Iran* as the nobleſt *iſland* (for ſo the *Greeks* and the *Arabs* would have called it) or at leaſt as the nobleſt *peninſula* on this habitable globe; and if M. *Bailly* had fixed on it as the *Atlantis* of *Plato*, he might have ſupported his opinion with far ſtronger arguments than any that he has adduced in favour of *New Zembla*. If the account, indeed, of the *Atlantes* be not purely an *Egyptian*, or an *Utopian* fable, I ſhould be more inclined to place them in *Iran* than in any region with which I am acquainted.

It may ſeem ſtrange, that the ancient hiſtory of ſo diſtinguiſhed an empire ſhould be yet ſo imperfectly known; but very ſatisfactory reaſons may be aſſigned for our ignorance of it: the principal of them are the ſuperficial knowledge of the *Greeks* and *Jews*, and the loſs of *Perſian* archives, or hiſtorical compoſitions. That the *Grecian* writers, before *Xenophon*, had *no* acquaintance with *Perſia*, and that *all* their accounts of it are *wholly* fabulous, is a paradox too extravagant to be ſeriouſly maintained: but their connection with it in war or peace had indeed been generally confined to bordering kingdoms under feudatory princes; and the firſt *Perſian* emperor, whoſe life and character they ſeem to have known with tolerable accuracy, was the great *Cyrus*, whom I call, without fear of contradiction, *Caikhoſrau*; for I ſhall then only doubt that the *Khoſrau* of *Firdauſi* was the *Cyrus* of the firſt *Greek* hiſtorian, and the hero of the oldeſt political and moral romance, when I doubt that *Louis Quatorze* and *Lewis the Fourteenth* were one and the ſame *French* King. It is utterly incredible that two different princes of *Perſia* ſhould each have been born in a foreign and hoſtile territory; ſhould each have been doomed to death in his infancy by his maternal grandfather, in conſequence of portentous dreams, real or invented; ſhould each have been ſaved by the remorſe of his deſtined murderer; and ſhould each, after a ſimilar education among herdſmen, as the ſon of a herdſman, have found means to reviſit his paternal kingdom; and having delivered it, after a long and triumphant war, from the tyrant who had invaded it, ſhould have reſtored it to the ſummit of power and magnificence! Whether ſo romantic a ſtory, which is the ſubject of an epic poem as majeſtic and entire as the *Iliad*, be hiſtorically true, we may feel perhaps an inclination to doubt; but it cannot with reaſon be denied, that the outline of it related to a ſingle hero, whom the *Aſiatics*, converſ-

ing with the father of *European* hiſtory, deſcribed according to their popular traditions by his true name, which the *Greek* alphabet could not expreſs: nor will a difference of names affect the queſtion, ſince the *Greeks* had little regard for truth, which they *ſacrificed* willingly *to the graces* of their language, and the nicety of their ears; and, if they could render foreign words melodious, they were never ſolicitous to make them exact; hence they probably formed *Cambyſes* from *Cambakhſh*, or *granting deſires*, a title rather than a name; and *Xerxes* from *Shiruyi*, a prince and warrior in the *Shahnamah*, or from *Shirſhah*, which might alſo have been a title; for the *Aſiatic* princes have conſtantly aſſumed new titles or epithets at different periods of their lives, or on different occaſions: a cuſtom which we have ſeen prevalent in our own times both in *Iran* and *Hinduſtan*, and which has been a ſource of great confuſion even in the ſcriptural accounts of *Babylonian* occurrences. Both *Greeks* and *Jews* have in fact accommodated *Perſian* names to their own articulation; and both ſeem to have diſregarded the native literature of *Iran*, without which they could at moſt attain but a general and imperfect knowledge of the country. As to the *Perſians* themſelves, who were contemporary with the *Jews* and *Greeks*, they muſt have been acquainted with the hiſtory of their own times, and with the traditional accounts of paſt ages; but for a reaſon, which will preſently appear, they choſe to conſider *Cayumers* as the founder of their empire; and, in the numerous diſtraction which followed the overthrow of *Dara*, eſpecially in the great revolution on the defeat of *Yezdegird*, their civil hiſtories were loſt, as thoſe of *India* have unhappily been, from the ſolicitude of the prieſts, the only depoſitaries of their learning, to preſerve their books of law and religion at the expence of all others. Hence it has happened, that nothing remains of genuine *Perſian* hiſtory before the dynaſty

of *Sasan*, except a few rustic traditions and fables, which furnished materials for the *Shahnamah*, and which are still supposed to exist in the *Pahlavi* language. All the annals of the *Pishdadi*, or *Assyrian* race, must be considered as dark and fabulous; and those of the *Cayani* family, or the *Medes* and *Persians*, as heroic and poetical; though the lunar eclipses, said to be mentioned by *Ptolemy*, fix the time of *Gushtasp*, the prince by whom *Zeratush* was protected, of the *Parthian* kings descended from *Arshac* or *Arsaces*, we know little more than the names; but the *Sasanis* had so long an intercourse with the emperors of *Rome* and *Byzantium*, that the period of their dominion may be called an historical age. In attempting to ascertain the beginning of the *Assyrian* empire, we are deluded, as in a thousand instances, by names arbitrarily imposed. It had been *settled* by chronologers, that the first monarchy established in *Persia* was the *Assyrian*; and *Newton*, finding some of opinion that it rose in the first century after the Flood, but unable by his own calculations to extend it farther back than *seven hundred and ninety* years before *Christ*, rejected part of the old system, and adopted the rest of it; concluding, that the *Assyrian* monarchs began to reign about two hundred years after *Solomon*, and that, in all preceding ages, the government of *Iran* had been divided into several petty states and principalities. Of this opinion I confess myself to have been; when, disregarding the wild chronology of the *Muselmans* and *Gabrs*, I had allowed the utmost natural duration to the reigns of eleven *Pishdadi* kings, without being able to add more than a hundred years to *Newton*'s computation. It seemed indeed unaccountably strange, that, although *Abraham* had found a regular monarchy in *Egypt*; although the kingdom of *Yemen* had just pretensions to very high antiquity; although the *Chinese*, in the twelfth century before our æra, had made approaches

at leaſt to the preſent form of their extenſive dominion; and although we can hardly ſuppoſe the firſt *Indian* monarchs to have reigned leſs than three thouſand years ago, yet *Perſia*, the moſt delightful, the moſt compact, the moſt deſirable country of them all, ſhould have remained for ſo many ages unſettled and diſunited. A fortunate diſcovery, for which I was firſt indebted to *Mir Muhammed Huſain*, one of the moſt intelligent *Muſelmans* in *India*, has at once diſſipated the cloud, and caſt a gleam of it on the primeval hiſtory of *Iran* and of the human race, of which I had long deſpaired, and which could hardly have dawned from any other quarter.

The rare and intereſting tract *on twelve different religions*, entitled the *Dabiſtin*, and compoſed by a *Mohammedan* traveller, a native of *Caſhmir*, named *Mohſan*, but diſtinguiſhed by the aſſumed ſurname of *Fani*, or *periſhable*, begins with the wonderfully curious chapter on the religion of *Huſhang*, which was long anterior to that of *Zeratuſht*, but had continued to be ſecretly profeſſed by many learned *Perſians* even to the author's time; and ſeveral of the moſt eminent of them, diſſenting in many points from the *Gabrs*, and perſecuted by the ruling powers of their country, had retired to *India*; where they compiled a number of books, now extremely ſcarce, which *Mohſan* had peruſed, and with the writers of which, or with many of them, he had contracted an intimate friendſhip. From them he learned, that a powerful monarchy had been eſtabliſhed for ages in *Iran* before the acceſſion of *Cayumers*; that it was called the *Mahabadian* dynaſty, for a reaſon which will ſoon be mentioned; and that many princes, of whom ſeven or eight are only named in the *Dabiſtan*, and among them *Mahbul*, or *Maha Beli*, had raiſed their empire to the zenith of human glory. If we

can rely on this evidence, which to me appears unexceptionable, the *Iranian* monarchy muſt have been the oldeſt in the world; but it will remain dubious to which of the three ſtocks *Hindu*, *Arabian*, or *Tartar*, the firſt Kings of *Iran* belonged; or whether they ſprang from a *fourth* race diſtinct from any of the others; and theſe are queſtions which we ſhall be able, I imagine, to anſwer preciſely, when we have carefully inquired into the *languages* and *letters*, *religion* and *philoſophy*, and incidentally into the *arts* and *ſciences*, of the ancient *Perſians*.

I. In the new and important remarks which I am going to offer on the ancient *languages* and *characters* of *Iran*, I am ſenſible that you muſt give me credit for many aſſertions which, on this occaſion, it is impoſſible to prove; for I ſhould ill deſerve your indulgent attention, if I were to abuſe it by repeating a dry liſt of detached words, and preſenting you with a vocabulary inſtead of a diſſertation; but, ſince I have no ſyſtem to maintain, and have not ſuffered imagination to delude my judgment; ſince I have habituated myſelf to form opinions of men and things from *evidence*, which is the only ſolid baſis of *civil*, as *experiment* is of *natural* knowledge; and ſince I have maturely conſidered the queſtions which I mean to diſcuſs, you will not, I am perſuaded, ſuſpect my teſtimony, or think that I go too far, when I aſſure you, that I will aſſert nothing poſitively which I am not able ſatisfactorily to demonſtrate. When *Muhammed* was born, and *Anushiravan*, whom he calls *the Juſt King*, ſat on the throne of *Perſia*, two languages appear to have been generally prevalent in the great empire of *Iran*; that of the *Court*, thence named *Deri*, which was only a refined and elegant dialect of the *Parſi*, ſo called from the province, of which *Shiraz* is now the capital, and that of the learned, in which moſt books were compoſed, and which had the

name of *Pahlavi*, either from the *heroes* who ſpoke it in former times, or from *Pahlu*, a track of land, which included, we are told, ſome conſiderable cities of *Irak*. The ruder dialects of both were, and, I believe, ſtill are ſpoken by the ruſtics in ſeveral provinces; and in many of them, as *Herat*, *Zabul*, *Siſtan*, and others, diſtinct idioms were vernacular, as it happens in every kingdom of great extent. Beſides the *Parſi* and *Pahlavi*, a very ancient and abſtruſe tongue was known to the prieſts and philoſophers, called *the language of the Zend*, becauſe a book on religious and moral duties, which they held ſacred, and which bore that name, had been written in it; while the *Pazand*, or comment on that work, was compoſed in *Pahlavi*, as a more popular idiom; but a learned follower of *Zeratuſht*, named *Bahman*, who lately died in *Calcutta*, where he had lived with me as a *Perſian* reader about three years, aſſured me that the *letters* of his prophet's book were properly called *Zend*, and the *language Aveſta*, as the words of the *Vedas* are *Sanſcrit*, and the characters *Nagari*; or as the old *Sagas* and poems of *Iceland* were expreſſed in *Runic* letters. Let us however, in compliance with cuſtom, give the name of *Zend* to the ſacred language of *Perſia*, until we can find, as we ſhall very ſoon, a fitter appellation for it. The *Zend* and the old *Pahlavi* are almoſt extinct in *Iran*; for among ſix or ſeven thouſand *Gabrs*, who reſide chiefly at *Yezd*, and in *Cirman*, there are very few who can read *Pahlavi*; and ſcarce any who even boaſt of knowing the *Zend*; while the *Parſi*, which remains almoſt pure in the *Shahnamah*, has now become by the intermixture of numberleſs *Arabic* words, and many imperceptible changes, a new language exquiſitely poliſhed by a ſeries of fine writers in proſe and verſe, and analogous to the different idioms gradually formed in *Europe* after the ſubverſion of the *Roman* empire: but with modern *Perſian* we have no concern in our preſent in-

quiry, which I confine to the ages that preceded the *Mohammedan* conqueſt. Having twice read the works of *Firdauſi* with great attention ſince I applied myſelf to the ſtudy of old *Indian* literature, I can aſſure you with confidence, that hundreds of *Parſi* nouns are pure *Sanſcrit*, with no other change than ſuch as may be obſerved in the numerous *bhaſhas*, or vernacular dialects of *India*; that very many *Persian* imperatives are the roots of *Sanſcrit* verbs; and that even the moods and tenſes of the *Persian* verb ſubſtantive, which is the model of all the reſt, are deducible from the *Sanſcrit* by an eaſy and clear analogy: we may hence conclude, that the *Parſi* was derived, like the various *Indian* dialects, from the language of the *Brahmans*; and I muſt add, that in the pure *Persian* I find no trace of any *Arabian* tongue, except what proceeded from the known intercourſe between the *Perſians* and *Arabs*, eſpecially in the time of *Bahram*, who was educated in *Arabia*, and whoſe *Arabic* verſes are ſtill extant, together with his heroic line in *Deri*, which many ſuppoſe to be the firſt attempt at *Persian* verſification in *Arabian* metre; but, without having recourſe to other arguments, *the composition of words*, in which the genius of the *Persian* delights, and which that of the *Arabic* abhors, is a deciſive proof that the *Parſi* ſprang from an *Indian*, and not from an *Arabian* ſtock. Conſidering languages as mere inſtruments of knowledge, and having ſtrong reaſons to doubt the exiſtence of genuine books in *Zend* or *Pahlavi* (eſpecially ſince the well-informed author of the *Dabiſtan* affirms the work of *Zeratuſht* to have been loſt, and its place ſupplied by a recent compilation) I had no inducement, though I had an opportunity, to learn what remains of thoſe ancient languages; but I often converſed on them with my friend *Bahman*; and both of us were convinced after full conſideration, that the *Zend* bore a ſtrong reſemblance to *Sanſcrit*, and the *Pahlavi* to *Arabic*. He had at my requeſt tranſlated

into *Pahlavi* the fine inscription exhibited in the *Gulistan*, on the diadem of *Cyrus*; and I had the patience to read the list of words from the *Pazand* in the appendix to the *Farhangi Jehangiri*. This examination gave me perfect conviction that the *Pahlavi* was a dialect of the *Chaldaic*; and of this curious fact I will exhibit a short proof. By the nature of the *Chaldean* tongue, most words ended in the first long vowel, like *shemia*, heaven; and that very word, unaltered in a single letter, we find in the *Pazend*, together with *laila*, night; *meyd*, water; *nira*, fire; *matra*, rain; and a multitude of others, all *Arabic* or *Hebrew*, with a *Chaldean* termination; so *zamar*, by a beautiful metaphor, from *pruning trees*, means in *Hebrew* to *compose verses*, and thence, by an easy transition to *sing* them; and in *Pahlavi* we see the verb *zamruniten*, to *sing*, with its forms *zamrunemi*, I *sing*, and *zamrunid*, he *sang*; the verbal terminations of the *Persian* being added to the *Chaldaic* root. Now all those words are integral parts of the language, not adventitious to it like the *Arabic* nouns and verbals engrafted on modern *Persian*; and this distinction convinces me, that the dialect of the *Gabrs*, which they pretend to be that of *Zeratusht*, and of which *Bahman* gave me a variety of written specimens, is a late invention of their priests, or subsequent at least to the *Muselman* invasion; for, although it may be possible that a few of their sacred books were preserved, as he used to assert, in sheets of lead or copper, at the botom of wells near *Yezd*, yet, as the conquerors had not only a spiritual, but a political interest in persecuting a warlike, robust, and indignant race of irreconcileable, conquered subjects, a long time must have elapsed, before the hidden scriptures could have been safely brought to light, and few, who could perfectly understand them, must then have remained; but, as they continued to profess among themselves the religion of their forefathers, it then became expedient for the *Mubeds*

to ſupply the loſt or mutilated works of their legiſlator by new compoſitions, partly from their imperfect recollection, and partly from ſuch moral and religious knowledge as they gleaned, moſt probably, among the *Chriſtians*, with whom they had an intercourſe. One rule we may fairly eſtabliſh in deciding the queſtion, Whether the books of the modern *Gabrs* were anterior to the invaſion of the *Arabs?* When an *Arabic* noun occurs in them, changed only by the ſpirit of the *Chaldean* idiom; as *werta* for *werd*, a roſe; *daba* for *dhahab*, gold; or *deman* for *zeman*, time, we may allow it to have been ancient *Pahlavi*; but when we meet with verbal nouns or infinitives, evidently formed by the rules of *Arabian* grammar, we may be ſure that the phraſes in which they occur are comparatively modern; and not a ſingle paſſage which *Bahman* produced from the books of his religion would abide this teſt.

We come now to the language of the *Zend*; and here I muſt impart a diſcovery which I lately made, and from which we may draw the moſt intereſting conſequences. M. *Anquetil*, who had the merit of undertaking a voyage to *India*, in his earlieſt youth, with no other view than to recover writings of *Zeratuſht*, and who would have acquired a brilliant reputation in *France*, if he had not ſullied it by his immoderate vanity and virulence of temper, which alienated the good will even of his own countrymen, has exhibited in his work, entitled *Zendaveſta*, two vocabularies in *Zend* and *Pahlavi*, which he had found in an approved collection of *Rawayat*, or *Traditional Pieces*, in modern *Perſian*. Of his *Pahlavi* no more need to be ſaid than that it ſtrongly confirms my opinion concerning the *Chaldaic* origin of that language; but, when I peruſed the *Zend* gloſſary, I was inexpreſſibly ſurprized to find that ſix or ſeven words in ten were pure *Sanſcrit*, and even ſome of their inflexions

formed by the rules of the *Vyacaran*; as *yushmacam*, the genitive plural of *yushmad*. Now M. *Anquetil* most certainly, and the *Persian* compiler most probably, had no knowledge of *Sanscrit*; and could not, therefore, have invented a list of *Sanscrit* words: it is, therefore, an authentic list of *Zend* words which had been preserved in books, or by tradition: and it follows, that the language of the *Zend* was at least a dialect of the *Sanscrit*, approaching perhaps as nearly to it as the *Pracrit*, or other popular idioms, which we know to have been spoken in *India* two thousand years ago. From all these facts it is a necessary consequence, that the oldest discoverable languages of *Persia* were *Chaldaic* and *Sanscrit*; and that, when they had ceased to be vernacular, the *Pahlavi* and *Zend* were deduced from them respectively, and the *Parsi* either from the *Zend*, or immediately from the dialect of the *Brahmans*; but all had perhaps a mixture of *Tartarian*; for the best lexicographers assert, that numberless words in ancient *Persian* are taken from the language of the *Cimmerians*, or the *Tartars* of *Kipchak*; so that the three families, whose lineage we have examined in former discourses, had left visible traces of themselves in *Iran* long before the *Tartars* and *Arabs* had rushed from their deserts, and returned from that very country from which, in all probability, they originally proceeded, and which the *Hindus* had abandoned in an earlier age, with positive commands from their legislators to revisit it no more. I close this head with observing, that no supposition of a mere political or commercial intercourse between the different nations, will account for the *Sanscrit* and *Chaldaic* words, which we find in the old *Persian* tongues; because they are, in the first place, too numerous to have been introduced by such means; and secondly, are not the names of exotic animals, commodities, or arts, but those of material elements, parts of the body, natural objects

and relations; affections of the mind, and other ideas common to the whole race of man.

If a nation of *Hindus*, it may be urged, ever possessed and governed the country of *Iran*, we should find on the very ancient ruins of the temple or palace, now called *the Throne of Jemshid*, some inscriptions in *Devanagari*, or at least in the characters on the stones at *Elephanta*, where the sculpture is unquestionably *Indian*, or in those on the *staff of Firuz Shah*, which exist in the heart of *India*; and such inscriptions we probably should have found, if that edifice had not been erected after the migration of the *Brahmans* from *Iran*, and the violent schism in the *Persian* religion, of which we shall presently speak; for, although the popular name of the building at *Istakar*, or *Persepolis*, be no certain proof that it was raised in the time of *Jemshid*, yet such a fact might easily have been preserved by tradition; and we shall soon have abundant evidence that the temple was posterior to the reign of the *Hindu* monarchs. The *cypresses* indeed, which are represented with the figures in procession, might induce a reader of the *Shahnamah* to believe, that the sculptures related to the new faith introduced by *Zeratusht*; but as a cypress is a beautiful ornament, and as many of the figures appear inconsistent with the reformed adoration of fire, we must have recourse to stronger proofs, that the *Takhti Jemshid* was erected after *Cayumers*. The building has lately been visited, and the characters on it examined, by Mr. *Francklin*; from whom we learn, that *Niebuhr* has delineated them with great accuracy; but without such testimony I should have suspected the correctness of the delineation, because the *Danish* traveller has exhibited two inscriptions in modern *Persian*, and one of them from the same place, which cannot have

been exactly tranſcribed: they are very elegant verſes of *Nizami* and *Sadi*, *on the inſtability of human greatneſs*, but ſo ill engraved or ſo ill copied, that if I had not had them nearly by heart, I ſhould not have been able to read them; and M. *Rouſſeau* of *Isfahan*, who tranſlated them with ſhameful inaccuracy, muſt have been deceived by the badneſs of the copy, or he never would have created a new king *Wakam*, by forming one word of *Jem* and the particle prefixed to it. Aſſuming, however, that we may reaſon as concluſively on the characters publiſhed by *Niebuhr* as we might on the monuments themſelves, were they now before us, we may begin with obſerving, as *Chardin* had obſerved on the very ſpot, that they bear no reſemblance whatever to the letters uſed by the *Gabrs* in their copies of the *Vendidad*. This I once urged, in an amicable debate with *Bahman*, as a proof that the *Zend* letters were a modern invention; but he ſeemed to hear me without ſurprize, and inſiſted that the letters to which I alluded, and which he had often ſeen, were monumental characters never uſed in books, and intended either to conceal ſome religious myſteries from the vulgar, or to diſplay the art of the ſculptor, like the embelliſhed *Cufick* and *Nagari* on ſeveral *Arabian* and *Indian* monuments. He wondered that any man could ſeriouſly doubt the antiquity of the *Pahlavi* letters; and in truth the inſcription behind the horſe of *Ruſtam*, which *Niebuhr* has alſo given us, is apparently *Pahlavi*, and might with ſome pains be decyphered; that character was extremely rude, and ſeems to have been written, like the *Roman* and the *Arabic*, in a variety of hands; for I remember to have examined a rare collection of old *Perſian* coins in the muſuem of the great Anatomiſt *William Hunter*; and, though I believed the legends to be *Pahlavi*, and had no doubt that they were coins of *Parthian* kings, yet I could not read the inſcrip-

tions without wasting more time than I had then at command, in comparing the letters and ascertaining the proportions in which they severally occurred. The gross *Pahlavi* was improved by *Zeratusht* or his disciples into an elegant and perspicuous character, in which the *Zendavesta* was copied; and both were written from the right hand to the left, like other *Chaldaic* alphabets, for they are manifestly both of *Chaldean* origin; but the *Zend* has the singular advantage of expressing all the long and short vowels by distinct marks in the body of each word, and all the words are distinguished by full points between them; so that if modern *Persian* were unmixed with *Arabic*, it might be written in *Zend* with the greatest convenience, as any one may perceive, by copying in that character a few pages of the *Shahnamah*. As to the unknown inscriptions in the palace of *Jemshid*, it may reasonably be doubted whether they contain a system of letters which any nation ever adopted: in *five* of them the letters, which are separated by points, may be reduced to forty, at least I can distinguish no more essentially different; and they all seem to be regular variations and compositions of a straight line and an angular figure like the head of a javelin, or a leaf (to use the language of botanists) *hearted and lanced*. Many of the *Runic* letters appear to have been formed of similar elements; and it has been observed, that the writing at *Persepolis* bears a strong resemblance to that which the *Irish* call *Ogham*. The word *Agam* in *Sanscrit* means *mysterious knowledge*; but I dare not affirm that the two words had a common origin; and only mean to suggest that, if the characters in question be really alphabetical, they were probably secret and sacerdotal, or a mere cypher perhaps, of which the priests only had the key. They might, I imagine, be decyphered if the language were certainly known; but in all other inscriptions of the

ſame ſort, the characters are too complex, and the variations of them too numerous, to admit an opinion that they could be ſymbols of articulate ſounds; for even the *Nagari* ſyſtem, which has more diſtinct letters than any known alphabet, conſiſts only of forty-nine ſimple characters, two of which are mere ſubſtitutions, and four of little uſe in *Sanſcrit*, or in any other language; while the more complicated figures, exhibited by *Niebuhr*, muſt be as numerous at leaſt as the *Chineſe* keys, which are the ſigns of *ideas* only, and ſome of which reſemble the old *Perſian* letters at *Istakhr*. The *Daniſh* traveller was convinced from his own obſervation that they were written from the left hand, like all the characters uſed by *Hindu* nations; but I muſt leave this dark ſubject, which I cannot illuminate, with a remark formerly made by myſelf, that the ſquare *Chaldaic* letters, a few of which are found on the *Perſian* ruins, appear to have been originally the ſame with the *Devanagari* before the latter were encloſed, as we now ſee them, in angular frames.

II. The primeval religion of *Iran*, if we rely on the authorities adduced by *Mohſani Fani*, was that, which Newton calls the oldeſt (and it may be juſtly called the nobleſt) of all religions: "A firm belief that One "Supreme God made the world by his power, and "continually governed it by his providence; a pious "fear, love, and adoration of him; a due reverence "for parents and aged perſons; a fraternal affection "for the whole human ſpecies, and a compaſſionate "tenderneſs even for the brute creation." A ſyſtem of devotion ſo pure and ſublime could hardly, among mortals, be of long duration; and we learn from the *Dabiſtan*, that the popular worſhip of the *Iranians* under *Huſhang*, was purely *Sabian*; a word of which I cannot offer any certain etymology, but which has been deduced by grammarians from *Saba*, an *hoſt*,

and particularly the *hoſt of heaven*, or the *celeſtial bodies*, in the adoration of which the *Sabian* ritual is believed to have conſiſted. There is a deſcription in the learned work juſt mentioned, of the ſeveral *Perſian* temples dedicated to the Sun and Planets, of the images adored in them, and of the magnificent proceſſions to them on preſcribed feſtivals; one of which is probably repreſented by ſculpture in the ruined city of *Jemſhid*. But the planetary worſhip in *Perſia* ſeems only a part of a far more complicated religion, which we now find in theſe *Indian* provinces; for *Mohſan* aſſures us that, in the opinion of the beſt informed *Perſians*, who profeſſed the faith of *Huſhang*, diſtinguiſhed from that of *Zeratuſht*, the firſt monarch of *Iran*, and of the whole earth, was *Mahabad* (a word apparently *Sanſcrit*) who divided the people into four orders, the *religious*, the *military*, the *commercial*, and the *ſervile*, to which he aſſigned names unqueſtionably the ſame in their origin with thoſe now applied to the four primary claſſes of the *Hindus*. They added, that he received from the Creator, and promulgated among men, *a ſacred book in a heavenly language*, to which the *Muſelman* author gives the *Arabic* title of *Deſatir*, or Regulations, but the original name of which he has not mentioned; and that *fourteen Mahabads* had appeared or would appear in human ſhapes for the government of this world. Now when we know that the *Hindus* believe in *fourteen Menus*, or celeſtial perſonages with ſimilar functions, the *firſt* of whom left a book of *regulations*, or *divine ordinances*, which they hold equal to the *Veda*, and the language of which they believe to be that of the gods, we can hardly doubt that the firſt corruption of the pureſt and oldeſt religion was the ſyſtem of *Indian* theology invented by the *Brahmans*, and prevalent in theſe territories, where the book of *Mahabad*, or *Menu*, is at this moment the ſtandard of all religious and moral duties. The acceſſion of *Cayu-*

mers to the throne of *Persia*, in the eighth or ninth century before *Christ*, ſeems to have been accompanied by a conſiderable revolution both in government and religion: he was moſt probably of a different race from the *Mahabadians* who preceded him, and began perhaps the new ſyſtem of national faith which *Huſhang*, whoſe name it bears, completed; but the reformation was partial; for, while they rejected the complex polytheiſm of their predeceſſors, they retained the laws of *Mahabad*, with a ſuperſtitious veneration for the ſun, the planets, and fire; thus reſembling the *Hindu* ſects, called *Sauras* and *Sagnicas*, the ſecond of which is very numerous at *Banares*, where many *agnihotras* are continually blazing, and where the *Sagnicas*, when they enter on their ſacerdotal office, kindle, with two pieces of the hard wood *Semi*, a fire which they keep lighted through their lives for their nuptial ceremony, the performance of ſolemn ſacrifices, the obſequies of departed anceſtors, and their own funeral pile. This remarkable rite was continued by *Zeratuſht*, who reformed the old religion by the addition of genii, or angels, preſiding over months and days, of new ceremonies in the veneration ſhown to fire, of a new work which he pretended to have received from Heaven, and, above all, by eſtabliſhing the actual adoration of one Supreme Being. He was born, according to *Mohſan*, in the diſtrict of *Rai*; and it was he (not, as *Ammianus* aſſerts, his protector *Guſhtaſb*) who travelled into *India*, that he might receive information from the *Brahmans* in theology and ethics. It is barely poſſible that *Pythagoras* knew him in the capital of *Irak*; but the *Grecian* ſage muſt then have been far advanced in years; and we have no certain evidence of an intercourſe between the two philoſophers. The reformed religion of *Persia* continued in force till that country was ſubdued by the *Muſelmans*; and, without ſtudying the *Zend*, we have ample information concerning

it in the modern *Persian* writings of ſeveral who profeſſed it. *Bahman* always named *Zeratuſht* with reverence; but he was in truth a pure Theiſt, and ſtrongly diſclaimed any adoration of the *fire* or other elements: he denied that the doctrine of two coeval principles, ſupremely good and ſupremely bad, formed any part of his faith; and he often repeated with emphaſis the verſes of *Firdausi* on the *proſtration* of *Cyrus* and his paternal grandfather before the blazing altar: "Think not that they were adorers of fire; "for that element was only an exalted object, on the "luſtre of which they fixed their eyes; they humbled "themſelves a whole week before *God*; and, if thy "underſtanding be ever ſo little exerted, thou muſt "acknowledge thy dependence on the Being ſupremely pure." In a ſtory of *Sadi*, near the cloſe of his beautiful *Buſtan*, concerning the idol of *Somanath*, or *Mahadeva*, he confounds the religion of the *Hindus* with that of the *Gabrs*, calling the *Brahmans* not only *Moghs* (which might be juſtified by a paſſage in the *Meſnavi*) but even readers of the *Zend* and *Pazend*. Now, whether this confuſion proceeded from real or pretended ignorance I cannot decide, but am as firmly convinced that the doctrines of the *Zend* were diſtinct from thoſe of the *Veda*, as I am that the religion of the *Brahmans*, with whom we converſe every day, prevailed in *Persia* before the acceſſion of *Cayumers*, whom the *Parsis*, from reſpect to his memory, conſider as the firſt of men, although they believe in *an univerſal deluge* before his reign.

With the religion of the old *Persians* their *philoſophy* (or as much as we know of it) was intimately connected; for they were aſſiduous obſervers of the luminaries, which they adored and eſtabliſhed, according to *Mohſan*, who confirms in ſome degree the fragments of *Beroſus*, a number of arti-

ficial cycles with diſtinct names, which ſeem to indicate a knowledge of the period in which the equinoxes appear to revolve. They are ſaid alſo to have known the moſt wonderful powers of nature, and thence to have acquired the fame of magicians and enchanters: but I will only detain you with a few remarks on that metaphyſical theology which has been profeſſed immemorially by a numerous ſect of *Perſians* and *Hindus*, was carried in part into *Greece*, and prevails even now among the learned *Muſelmans*, who ſometimes avow it without reſerve. The modern philoſophers of this perſuaſion are called *Sufis*, either from the *Greek* word for a *ſage*, or from the *woollen* mantle which they uſed to wear in ſome provinces of *Perſia*: their fundamental tenets are, that nothing exiſts abſolutely but *God*; that the human ſoul is an emanation from his eſſence, and though divided for a time from its heavenly ſource, will be finally reunited with it; that the higheſt poſſible happineſs will ariſe from its reunion; and that the chief good of mankind in this tranſitory world, conſiſts in as perfect an *union* with the Eternal Spirit as the incumbrances of a mortal frame will allow; that for this purpoſe they ſhould break all *connection* (or *taalluk*, as they call it) with extrinſic objects, and paſs through life without *attachments*, as a ſwimmer in the ocean ſtrikes freely without the impediment of clothes; that they ſhould be ſtraight and free as the cypreſs, whoſe fruit is hardly perceptible, and not ſink under a load, like fruit-trees *attached* to a trellis; that, if mere earthly charms have power to influence the ſoul, the *idea* of celeſtial beauty muſt overwhelm it in extatic delight; that for want of apt words to expreſs the divine perfections and the ardour of devotion, we muſt borrow ſuch expreſſions as approach the neareſt to our ideas, and ſpeak of *Beauty* and *Love* in a tranſcendent and myſtical ſenſe; that, like a *reed* torn from its native

bank, like *wax* ſeparated from its delicious honey, the ſon of man bewails its diſunion with *melancholy muſic*, and ſheds burning tears, like the lighted taper waiting paſſionately for the moment of its extinction, as a diſengagement from earthly trammels, and the means of returning to its Only Beloved. Such in part (for I omit the minuter and more ſubtil metaphyſics of the *Sufis*, which are mentioned in the *Dabiſtan)* is the wild and enthuſiaſtic religion of the modern *Perſian* poets, eſpecially of the ſweet *Hafiz* and the great *Maulavi:* ſuch is the ſyſtem of the *Vedanti* philoſophers and beſt lyric poets of *India*; and, as it was a ſyſtem of the higheſt antiquity in both nations, it may be added to the many other proofs of an immemorial affinity between them.

III. On the ancient *monuments* of *Perſian* ſculpture and architecture, we have already made ſuch obſervations as were ſufficient for our purpoſe; nor will you be ſurprized at the diverſity between the figures at *Elephanta*, which are manifeſtly *Hindu*, and thoſe at *Perſepolis*, which are merely *Sabian*, if you concur with me in believing that the *Takhti Jemſhid* was erected after the time of *Cayumers*, when the *Brahmans* had migrated from *Iran*, and when their intricate mythology had been ſuperſeded by the ſimpler adoration of the planets and of fire.

IV. As to the *ſciences* or *arts* of the old *Perſians*, I have little to ſay; and no complete evidence of them ſeems to exiſt. *Mohſan* ſpeaks more than once of ancient verſes in the *Pahlavi* language; and *Bahman* aſſured me, that ſome ſcanty remains of them had been preſerved: their muſic and painting, which *Nizami* celebrated, have irrecoverably periſhed; and in regard to *Mani*, the painter and impoſtor, whoſe book of drawings, called *Artang*, which he pretended to be

divine, is ſuppoſed to have been deſtroyed by the *Chineſe*, in whoſe dominions he had ſought refuge,—the whole tale is too modern to throw any light on the queſtions before us concerning the origin of nations and the inhabitants of the primitive world.

Thus has it been proved by clear evidence and plain reaſoning, that a powerful monarchy was eſtabliſhed in *Iran* long before the *Aſſyrian*, or *Piſhdadi*, government: that it was in truth a *Hindu* monarchy, though if any chuſe to call it *Cuſian*, *Caſdean*, or *Scythian*, we ſhall not enter into a debate on mere names; that it ſubſiſted many centuries, and that its hiſtory has been engrafted on that of the *Hindus*, who founded the monarchies of *Ayodhya* and *Indrapreſtha*; that the language of the firſt *Perſian* empire was the mother of the *Sanſcrit*, and conſequently of the *Zend* and *Parſi*, as well as of *Greek*, *Latin*, and *Gothic*; that the language of the *Aſſyrians* was the parent of *Chaldaic* and *Pahlavi*, and that the primary *Tartarian* la-guage alſo had been current in the ſame empire; although, as the *Tartars* had no books or even letters, we cannot with certainty trace their unpoliſhed and variable idioms. We diſcover, therefore in *Perſia*, at the earlieſt dawn of hiſtory, the *three* diſtinct races of men, whom we deſcribed on former occaſions, as poſſeſſors of *India*, *Arabia*, *Tartary*; and whether they were collected in *Iran* from diſtant regions, or diverged from it as from a common centre, we ſhall eaſily determine by the following conſiderations. Let us obſerve, in the firſt place, the central poſition of *Iran*, which is bounded by *Arabia*, by *Tartary*, and by *India*; whilſt *Arabia* lies contiguous to *Iran* only, but is remote from *Tartary*, and divided even from the ſkirts of *India* by a conſiderable gulf; no country, therefore, but *Perſia* ſeems likely to have

ſent forth its colonies to all the kingdoms of *Aſia*. The *Brahmans* could never have migrated from *India* to *Iran*, becauſe they are expreſsly forbidden by their oldeſt exiſting laws to leave the region which they inhabit at this day; the *Arabs* have not even a tradition of an emigration into *Perſia* before *Mohammed*, nor had they indeed any inducement to quit their beautiful and extenſive domains; and as to the *Tartars*, we have no trace in hiſtory of their departure from their plains and foreſts till the invaſion of the *Medes*, who, according to etymologiſts, were the ſons of *Madai*; and even they were conducted by princes of an *Aſſyrian* family. The *three* races, therefore, whom we have already mentioned (and more than three we have not yet found) migrated from *Iran* as from their common country; and thus the *Saxon* Chronicle, I preſume from good authority, brings the firſt inhabitants of *Britain* from *Armenia*; while a late very learned writer concludes, after all his laborious reſearches, that the *Goths* or *Scythians* came from *Perſia*; and another contends with great force, that both the *Iriſh* and old *Britons* proceeded ſeverally from the borders of the *Caſpian*; a coincidence of concluſions from different media by perſons wholly unconnected, which could ſcarce have happened if they were not grounded on ſolid principles. We may therefore hold this propoſition firmly eſtabliſhed, that *Iran*, or *Perſia* in its largeſt ſenſe, was the true centre of population, of knowledge, of languages, and of arts; which, inſtead of travelling weſtward only, as it has been fancifully ſuppoſed, or eaſtward, as might with equal reaſon have been aſſerted, were expanded in all directions to all the regions of the world in which the *Hindu* race had ſettled under various denominations: but whether *Aſia* has not produced other races of men, diſtinct from the *Hindus*, the *Arabs*, or the *Tartars*; or whether any apparent diverſity may not have ſprung from an intermixture of thoſe three

in different proportions, muſt be the ſubject of a future inquiry. There is another queſtion of more immediate importance, which you, gentlemen, only can decide; namely, "By what means we can preſerve "our Society from dying gradually away? as it has advanced gradually to its preſent (ſhall I ſay flouriſhing or languiſhing?) ſtate." It has ſubſiſted five years without any expence to the members of it, until the firſt volume of our Tranſactions was publiſhed; and the price of that large volume, if we compare the different values of money in *Bengal* and in *England*, is not more than equal to the *annual* contribution towards the charges of the Royal Society by each of its fellows, who may not have choſen to compound for it on his admiſſion. This I mention not from an idea that any of us could object to the purchaſe of one copy at leaſt, but from a wiſh to inculcate the neceſſity of our common exertions in promoting the ſale of the work, both here and in *London*. In vain ſhall we meet as a literary body, if our meetings ſhall ceaſe to be ſupplied with original diſſertations and memorials; and in vain ſhall we collect the moſt intereſting papers, if we cannot publiſh them occaſionally without expoſing the ſuperintendents of the Company's preſs, who undertake to print them at their own hazard, to the danger of a conſiderable loſs. By united efforts the *French* have compiled their ſtupendous repoſitories of univerſal knowledge; and by united efforts only can we hope to rival them, or to diffuſe over our own country and the reſt of *Europe* the light attainable by our *Aſiatic Reſearches*.

IV.

A LETTER

FROM

THE LATE HENRY VANSITTART, ESQ.

TO THE PRESIDENT.

Sir,

HAVING ſome time ago met with a *Perſian* abridgment, compoſed by *Maulavi Khairuddin*, of the *aſrarul Afaghinah*, or the ſecrets of the *Afghans*, a book written in the *Puſhto* language by *Huſain*, the ſon of *Sabir*, the ſon of *Khizr*, the diſciple of *Hazrat Shah Kaſim Sulaimani*, whoſe tomb is in *Chunargur*, I was induced to tranſlate it. Although it opens with a very wild deſcription of the origin of that tribe, and contains a narrative which can by no means be offered upon the whole as a ſerious and probable hiſtory; yet I conceive that the knowledge of what a nation ſuppoſe themſelves to be, may be intereſting to a Society like this, as well as of what they really are. Indeed, the commencement of almoſt every hiſtory is fabulous; and the moſt enlightened nations, after they have arrived at that degree of civilization and importance which has enabled and induced them to commemorate their actions, have always found a vacancy at their outſet, which invention, or at beſt preſumption, muſt ſupply. Such fictions appear at firſt in the form of traditions; and having in this ſhape amuſed ſucceſſive generations by a gratification of their national vanity, they are committed to writing, and acquire the authority of hiſtory.

As a kingdom is an aſſemblage of component parts, condenſed by degrees from ſmaller aſſociations of individuals to their general union, ſo hiſtory is a combination of the tranſactions not only of the different tribes, but even of the individuals of the nation of which it treats: each particular narrative in ſuch a general collection muſt be ſummary and incomplete. Biography, therefore, as well as deſcriptions of the manners, actions, and even opinions of ſuch tribes as are connected with a great kingdom, are not only entertaining in themſelves but uſeful, as they explain and throw a light upon the hiſtory of the nation.

Under theſe impreſſions I venture to lay before the Society the tranſlation of an abridged hiſtory of the *Afghans*: a tribe at different times ſubject to and always connected with the kingdoms of *Perſia* and *Hinduſtan.* I alſo ſubmit a ſpecimen of their language, which is called by them *Pukhto*; but this word is ſoftened in *Perſian* into *Puſhto*.

I am, *Sir*,

with the greateſt reſpect,

your moſt obedient humble ſervant,

HENRY VANSITTART.

Calcutta, March 3, 1784.

ON

THE DESCENT OF THE AFGHANS FROM THE JEWS.

THE *Afghans*, according to their own traditions, are the posterity of *Melic Talut* (king *Saul*) who, in the opinion of ſome, was a deſcendant of *Judah*, the ſon of *Jacob*; and, according to others, of *Benjamin*, the brother of *Joſeph*.

In a war which raged between the children of *Iſrael* and the *Amalekites*, the latter being victorious, plundered the *Jews*, and obtained poſſeſſion of the ark of the covenant. Conſidering this the god of the *Jews*, they threw it into the fire, which did not affect it. They afterwards attempted to cleave it with axes, but without ſucceſs: every individual who treated it with indignity was puniſhed for his temerity. They then placed it in their temple; but all their idols bowed to it. At length they faſtened it upon a cow, which they turned looſe in a wilderneſs.

When the prophet *Samuel* aroſe, the children of *Iſrael* ſaid to him, "We have been totally ſubdued "by the *Amalekites*, and have no king. Raiſe to us "a king, that we may be enabled to contend for the "glory of God." *Samuel* ſaid, "In caſe you are led "out to battle, are you determined to fight?" They anſwered, "What has befallen us that we ſhould not "fight againſt infidels? That nation has baniſhed "us from our country and children." At this time the angel *Gabriel* deſcended, and, delivering a wand, ſaid, "It is the command of God that the perſon "whoſe ſtature ſhall correſpond with this wand, ſhall be king of *Iſrael*."

Melic Talut was at that time a man of inferior condition, and performed the humble employment of feeding the goats and cows of others. One day a cow under his charge was accidentally loſt. Being diſappointed in his ſearches, he was greatly diſtreſſed, and applied to *Samuel*, ſaying, "I have loſt a cow; "and do not poſſeſs the means of ſatisfying the owner. "Pray for me, that I may be extricated from this "difficulty." *Samuel*, perceiving that he was a man of lofty ſtature, aſked his name. He anſwered, *Talut*. *Samuel* then ſaid, "Meaſure *Talut* with the wand "which the angel *Gabriel* brought." His ſtature was equal to it. *Samuel* then ſaid, "*God* has raiſed *Talut* to be your king." The children of *Iſrael* anſwered, "We are greater than our king. We are "men of dignity, and he is of inferior condition. "How ſhall he be our king." *Samuel* informed them they ſhould know that God had conſtituted *Talut* their king, by his reſtoring the ark of the covenant. He accordingly reſtored it, and they acknowledged him their ſovereign.

After *Talut* obtained the kingdom, he ſeized part of the territories of *Jalut*, or *Goliah*, who aſſembled a large army, but was killed by *David*. *Talut* afterwards died a martyr in a war againſt the infidels; and God conſtituted *David* king of the *Jews*.

Melic Talut had two ſons, one called *Berkia*, and the other *Irmia*, who ſerved *David*, and were beloved by him. He ſent them to fight againſt the infidels; and, by God's aſſiſtance, they were victorious.

The ſon of *Berkia* was called *Afghan*, and the ſon of *Irmia* was named *Uſbec*. Thoſe youths diſtinguiſhed themſelves in the reign of *David*, and were employed by *Solomon*. *Afghan* was diſtin-

guiſhed by his corporal ſtrength, which ſtruck terror into Demons and Genii. *Uſbec* was eminent for his learning.

Afghan uſed frequently to make excurſions to the mountains; where his progeny, after his death eſtabliſhed themſelves, lived in a ſtate of independence, built forts, and exterminated the infidels.

When the ſelect of creatures, *Muhammed*, appeared upon earth, his fame reached the *Afghans*, who ſought him in multitudes under their leaders *Khalid* and *Abdul Raſhid*, ſons of *Walid*. The prophet honoured them with the moſt gracious reception, ſaying, "Come, O *Muluc*, or Kings;" whence they aſſumed the title of *Melic*, which they enjoy to this day. The prophet gave them his enſign, and ſaid that the faith would be ſtrengthened by them.

Many ſons were born of *Khalid*, the ſon of *Walid*, who ſignalized themſelves in the preſence of the prophet, by fighting againſt the infidels. *Muhammed* honoured and prayed for them.

In the reign of Sultan *Mahmud* of *Ghaznah*, eight men arrived, of the poſterity of *Khalid* the ſon of *Walid*, whoſe names were *Kalun*, *Alun*, *Daud*, *Yalua*, *Ahmed*, *Awin*, and *Ghazi*. The Sultan was much pleaſed with them, and appointed each a commander in his army. He alſo conferred on them the offices of *Vazir*, and *Vakili Mutlak*, or Regent of the Empire.

Wherever they were ſtationed they obtained poſſeſſion of the country, built moſques, and overthrew the temples of idols. They encreaſed ſo much, that the army of *Mahmud* was chiefly

composed of *Afghans*. When *Herhind*, a powerful prince of *Hindustan*, meditated an invasion of *Ghaznah*, Sultan *Mahmud* dispatched against him the descendants of *Khalid* with twenty thousand horse: a battle ensued; the *Afghans* made the attack; and, after a severe engagement, which lasted from daybreak till noon, defeated *Herhind*, killed many of the infidels, and converted some to the *Muhammedan* faith.

The *Afghans* now began to establish themselves in the mountains; and some settled in cities with the permission of Sultan *Mahmud*. They framed regulations, dividing themselves into four classes, agreeably to the following description:—The first is the *pure* class, consisting of those whose fathers and mothers were *Afghans*. The second class consists of those whose fathers were *Afghans*, and mothers of another nation. The third class contains those whose mothers were *Afghans*, and fathers of another nation. The fourth class is composed of the children of women whose mothers were *Afghans*, and fathers and husbands of a different nation. Persons who do not belong to one of these classes, are not called *Afghans*.

After the death of Sultan *Mahmud* they made another settlement in the mountains. *Shihabuddin Gauri*, a subsequent Sultan of *Ghaznah*, was twice repulsed from *Hindustan*. His *Vazir* assembled the people, and asked if any of the posterity of *Khalid* were living. They answered, "Many now live "in a state of independence in the mountains, "where they have a considerable army." The *Vazir* requested them to go to the mountains, and by entreaties prevail on the *Afghans* to come; for they were the descendants of companions of the prophet.

The inhabitants of *Ghaznah* undertook this embaſſy, and, by entreaties and preſents, conciliated the minds of the *Afghans*, who promiſed to engage in the ſervice of the Sultan, provided he would himſelf come and enter into an agreement with them. The Sultan viſited them in their mountains, honoured them, and gave them dreſſes and other preſents. They ſupplied him with twelve thouſand horſe, and a conſiderable army of infantry. Being diſpatched by the Sultan before his own army, they took *Dehli*, killed *Roy Pahtoura* the king, his miniſters and nobles; laid waſte the city, and made the infidels priſoners. They afterwards exhibited nearly the ſame ſcene in *Canauj*.

The Sultan, pleaſed by the reduction of thoſe cities, conferred honours upon the *Afghans*. It is ſaid that he then gave them the titles of *Patan* and *Khan*. The word *Patan* is derived from the *Hindi* verb *Paitna*, *to ruſh*, in alluſion to their alacrity in attacking the enemy. The *Patans* have greatly diſtinguiſhed themſelves in the hiſtory of *Hinduſtan*, and are divided into a variety of ſects.

The race of *Afghans* poſſeſſed themſelves of the Mountain of *Solomon*, which is near *Kandahar*, and the circumjacent country, where they have built forts: this tribe has furniſhed many kings. The following monarchs of this race have ſat upon the throne of *Dehli*:—Sultan *Behlole*, *Afghan Lodi*, Sultan *Secander*, Sultan *Ibrahim*, *Shir Shah*, *Iſlam Shah*, *Adil Shah Sur*. They alſo number the following kings of *Gaur*:—*Solaiman Shah Gurzani*, *Bayazid Shah*, and *Kutb Shah*; beſides whom their nation has produced many conquerors of provinces. The *Afghans* are called *Solaimani*, either becauſe they were formerly the ſubjects of *Solomon*, king of the *Jews*, or becauſe they inhabit the Mountain of *Solomon*.

The tranflation being finifhed, I fhall only add that the country of the *Afghans*, which is a province of *Cabul*, was originally called *Roh*, and from hence is derived the name of the *Rohillahs*. The city, which was eftablifhed in it by the *Afghans*, was called by them *Paifhiwer*, or *Paifhor*, and is now the name of the whole diftrict. The fects of the *Afghans*, or *Patans*, are very numerous. The principal are thefe:—*Lodi*, *Lohauni*, *Sur*, *Serwani*, *Yufufzihi*, *Bangifh*, *Dilazai*, *Khatti*, *Yasin*, *Khail*, and *Baloje*. The meaning of *Zihi*, is offspring; and of *Khail*, fect. A very particular account of the *Afghans* has been written by the late *Hafiz Rahmat Khan*, a chief of the *Rohillahs*, from which the curious reader may derive much information. They are *Mufelmans*, partly of the *Sunni*, and partly of the *Shiah* perfuafion. They are great boafters of the antiquity of their origin, and reputation of their tribe; but other *Mufelmans* entirely reject their claim, and confider them of modern and even bafe extraction. However, their character may be collected from hiftory, they have diftinguifhed themfelves by their courage, both fingly and unitedly, as principals and auxiliaries. They have conquered for their own princes and for foreigners, and have always been confidered the main ftrength of the army in which they have ferved. As they have been applauded for virtues, they have alfo been reproached for vices, having fometimes been guilty of treachery, and even acted the bafe part of affaffins.

A Specimen of the PUSHTO LANGUAGE.

لِستَمَ ظَالِمَانُ حَاكِمَانُ

اُوْرَ گُوْرَ پیْشَوْرَ دِرِيْ وَ اْرَه يَوْ دِيْ

By the oppreſſion of tyrannical rulers,
Fire, the grave, and *Paiſhór*, all three have been rendered equal.

دسُنَّتْ وِ پُرْ خُصَةَ دَيْ رَاْ غلِيْ رَوَايَتْ

With reſpect to prayers enjoined by the *Sunnah*, they are remitted.

It is thus expreſſed in the reports :

كَاي اُو كَادِيرَه شَهِوِيْ كَاىْ نَكَهِيْس پرِيْ نِوِيْ

If a *man* perform them, it is very laudable. If he do not perform them, it is no crime in him.

ميرزا خان

اِي مِيرزَا كَه دَ خُوْيِ بِهْتَرِيْ نَوِيْ
دَ سَيَّد تَغَاوَتْ سِهِ دَيْ لَهَ بَامنَه

If the diſpoſition be not good, *O Mírzá*,
What difference is there between a *Sayyed* and a *Bráhman* !

NOTE BY THE PRESIDENT.

THIS account of the *Afghans* may lead to a very interesting discovery. We learn from *Esdras*, that the ten tribes, after a wandering journey, came to a country called *Arsareth*; where, we may suppose, they settled. Now the *Afghans* are said, by the best *Persian* historians, to be descended from the *Jews*; they have traditions among themselves of such a descent; and it is even asserted, that their families are distinguished by the names of *Jewish* tribes, although, since their conversion to the *Islam*, they studiously conceal their origin: the *Pushto* language, of which I have seen a dictionary, has a manifest resemblance to the *Chaldaic*; and a considerable district under their dominion is called *Hazareh*, or *Hazaret*, which might easily have been changed into the word used by *Esdras*. I strongly recommend an inquiry into the literature and history of the *Afghans*.

V.

REMARKS

ON THE

ISLAND OF HINZUAN, OR JOHANNA.

BY THE PRESIDENT.

HINZUAN (a name which has been gradually corrupted into *Anzuame*, *Anjuan*, *Juanny*, and *Johanna*) has been governed about two centuries by a colony of *Arabs*, and exhibits a curious inſtance of the ſlow approaches toward civilization, which are made by a ſmall community, with many natural advantages, but with few means of improving them. An account of this *African* iſland, in which we hear the language and ſee the manners of *Arabia*, may neither be unintereſting in itſelf, nor foreign to the objects of inquiry propoſed at the inſtitution of our Society.

On *Monday*, the 28th of *July*, 1783, after a voyage, in the *Crocodile*, of ten weeks and two days from the rugged iſlands of *Cape Verd*, our eyes were delighted with a proſpect ſo beautiful, that neither a painter nor a poet could perfectly repreſent it, and ſo cheering to us, that it can juſtly be conceived by ſuch only as have been in our preceding ſituation. It was the ſun riſing in full ſplendor on the iſle of *Mayata* (as the ſeamen called it) which we had joyfully diſtinguiſhed the preceding afternoon by the height of its peak, and which now appeared at no great diſtance from the windows of our cabin; while *Hinzuan*, for which we had ſo long panted, was plainly diſcernible a-head, where its high lands preſented themſelves with remarkable bold-

nefs. The weather was fair, the water fmooth; and a gentle breeze drove us eafily before dinner-time round a rock, on which the *Brilliant* ftruck juft a year before, into a commodious road*, where we dropped our anchor early in the evening. We had feen *Mohila*, another fifter ifland, in the courfe of the day.

The frigate was prefently furrounded with canoes, and the deck foon crowded with natives of all ranks, from the high-born chief, who wafhed linen, to the half-naked flave, who only paddled. Moft of them had letters of recommendation from *Englifhmen*, which none of them were able to read, though they fpoke *Englifh* intelligibly; and fome appeared vain of titles, which our countrymen had given them in play, according to their fuppofed ftations. We had *Lords*, *Dukes*, and *Princes* on board, foliciting our cuftom, and importuning us for prefents. In fact, they were too fenfible to be proud of empty founds, but juftly imagined, that thofe ridiculous titles would ferve as marks of diftinction, and, by attracting notice, procure for them fomething fubftantial. The only men of real confequence in the ifland, whom we faw before we landed, were the Governor *Abdullah*, fecond coufin to the king, and his brother *Alwi*, with their feveral fons; all of whom will again be particularly mentioned: they underftood *Arabic*, feemed zealots in the *Mohammedan* faith, and admired my copies of the *Alkoran*; fome verfes of which they read, whilft *Alwi* perufed the opening of another *Arabian* manufcript, and explained it in *Englifh* more accurately than could have been expected.

The next morning fhowed us the ifland in all its beauty; and the fcene was fo diverfified, that a dif-

* Lat. 12° 10′ 47″ S. Long. 44° 25′ 5″ E. by the Mafter.

tinct view of it could hardly have been exhibited by the best pencil: you must, therefore, be satisfied with a mere description, written on the very spot, and compared attentively with the natural landscape. We were at anchor in a fine bay, and before us was a vast amphitheatre, of which you may form a general notion by picturing in your minds a multitude of hills infinitely varied in size and figure, and then supposing them to be thrown together, with a kind of artless symmetry, in all imaginable positions. The back ground was a series of mountains, one of which is pointed, near half a mile perpendicularly high from the level of the sea, and little more than three miles from the shore: all of them were richly clothed with wood, chiefly fruit-trees, of an exquisite verdure. I had seen many a mountain of a stupendous height in *Wales* and *Swisserland*, but never saw one before, round the bosom of which the clouds were almost continually rolling, while its green summit rose flourishing above them, and received from them an additional brightness. Next to this distant range of hills was another tier, part of which appeared charmingly verdant, and part rather barren; but the contrast of colours changed even this nakedness into a beauty. Nearer still were innumerable mountains, or rather cliffs, which brought down their verdure and fertility quite to the beach; so that every shade of green, the sweetest of colours, was displayed at one view by land and by water. But nothing conduced more to the variety of this enchanting prospect, than the many rows of palm-trees, especially the tall and graceful *Arecas* on the shores, in the valleys, and on the ridges of hills, where one might almost suppose them to have been planted regularly by design. A more beautiful appearance can scarce be conceived, than such a number of elegant palms in such a situation, with luxuriant tops, like verdant plumes, placed at just intervals, and

ſhowing between them part of the remoter landſcape, while they left the reſt to be ſupplied by the beholder's imagination. The town of *Matſamudo* lay in our left, remarkable at a diſtance for the tower of the principal moſque, which was built by *Halimah*, a queen of the iſland, from whom the preſent king is deſcended: a little on our right was a ſmall town, called *Bantani*. Neither the territory of *Nice*, with its olives, date-trees, and cypreſſes, nor the iſles of *Hieres*, with their delightful orange-groves, appeared ſo charming to me as the view from the road of *Hinzuan*; which, nevertheleſs, is far ſurpaſſed, as the Captain of the *Crocodile* aſſured us, by many of the iſlands in the Southern Ocean. If life were not too ſhort for the complete diſcharge of all our reſpective duties, public and private, and for the acquiſition even of neceſſary knowledge in any degree of perfection, with how much pleaſure and improvement might a great part of it be ſpent in admiring the beauties of this wonderful orb, and contemplating the nature of man in all its varieties!

We haſtened to tread on firm land, to which we had been ſo long diſuſed, and went on ſhore, after breakfaſt, to ſee the town, and return the Governor's viſit. As we walked, attended by a crowd of natives, I ſurprized them by reading aloud an *Arabic* inſcription over the gate of a moſque, and ſtill more, when I entered it, by explaining four ſentences, which were written very diſtinctly on the wall, ſignifying, "that "the world was given us for our own edification, "not for the purpoſe of raiſing ſumptuous build-"ings; life, for the diſcharge of moral and reli-"gious duties, not for pleaſurable indulgences; "wealth, to be liberally beſtowed, not avariciouſly "hoarded; and learning, to produce good actions, "not empty diſputes." We could not but reſpect the temple even of a falſe prophet, in which we

found ſuch excellent morality: we ſaw nothing better among the *Romiſh* trumpery in the church at *Madeira*. When we came to *Abdullah*'s houſe, we were conducted through a ſmall court-yard into an open room, on each ſide of which was a large and convenient ſofa, and above it a high bed-place in a dark receſs, over which a chintz counterpoint hung down from the ceiling. This is the general form of the beſt rooms in the iſland; and moſt of the tolerable houſes have a ſimilar apartment on the oppoſite ſide of the court, that there may be at all hours a place in the ſhade for dinner, or for repoſe. We were entertained with ripe dates from *Yemen*, and the milk of cocoanuts; but the heat of the room, which ſeemed acceſſible to all who choſe to enter it, and the ſcent of muſk, or civet, with which it was perfumed, ſoon made us deſirous of breathing a purer air; nor could I be detained long by the *Arabic* manuſcripts which the Governor produced, but which appeared of little uſe, and conſequently of no value, except to ſuch as love mere curioſities. One of them, indeed, relating to the penal law of the *Mohammedans*, I would gladly have purchaſed at a juſt price; but he knew not what to aſk; and I knew that better books on that ſubject might be procured in *Bengal*. He then offered me a black boy for one of my *Alkorans*, and preſſed me to barter an *Indian* dreſs, which he had ſeen on board the ſhip, for a cow and calf. The golden ſlippers attracted him moſt, ſince his wife, he ſaid, would like to wear them; and, for that reaſon, I made him a preſent of them; but had deſtined the book and the robe for his ſuperior. No high opinion could be formed of *Sayyad Abdullah*, who ſeemed very eager for gain, and very ſervile where he expected it.

Our next viſit was to *Shaikh Salim*, the king's eldeſt ſon; and if we had ſeen him firſt, the ſtate

of civilization in *Hinzuan* would have appeared at its loweſt ebb. The worſt *Engliſh* hackney in the worſt ſtable is better lodged, and looks more princely than this heir apparent; but though his mien and apparel were extremely ſavage, yet allowance ſhould have been made for his illneſs; which, as we afterwards learned, was an abſceſs in the ſpleen: a diſorder not uncommon in that country, and frequently cured, agreeably to the *Arabian* practice, by the actual cautery. He was inceſſantly chewing pieces of the *Areca-nut* with ſhell-lime: a cuſtom borrowed, I ſuppoſe, from the *Indians*, who greatly improve the compoſition with ſpices and betel-leaves, to which they formerly added camphor: all the natives of rank chewed it, but not, I think, to ſo great an exceſs. Prince *Salim* from time to time gazed at himſelf with complacency in a piece of broken looking-glaſs, which was glued on a ſmall board: a ſpecimen of wretchedneſs, which we obſerved in no other houſe; but many circumſtances convinced us that the apparently low condition of his royal highneſs, who was not on bad terms with his father, and ſeemed not to want authority, proceeded wholly from his avarice. His brother *Hamdullah*, who generally reſides in the town of *Domoni*, has a very different character, being eſteemed a man of worth, good ſenſe, and learning: he had come, the day before, to *Matſamudo*, on hearing that an *Engliſh* frigate was in the road; and I, having gone out for a few minutes to read an *Arabic* inſcription, found him on my return devouring a manuſcript which I had left with ſome of the company. He is a *Kadi* or *Mohammedan* judge; and as he ſeemed to have more knowledge than his countrymen, I was extremely concerned that I had ſo little converſation with him. The king, *Shaikh Ahmed*, has a younger ſon, named *Abdullah*, whoſe uſual reſidence is in the town of *IVani*, which he ſeldom leaves, as the ſtate of his health is very infirm. Since the ſucceſſion to the title and authority of *Sul-*

tan is not unalterably fixed in one line, but requires confirmation by the chiefs of the iſland, it is not improbable that they may hereafter be conferred on prince *Hamdullah.*

A little beyond the hole in which *Salim* received us, was his *haram*, or the apartment of his women, which he permitted us all to ſee, not through politeneſs to ſtrangers, as we believed at firſt, but as I learned afterwards from his own lips, in expectation of a preſent. We ſaw only two or three miſerable creatures with their heads covered, while the favourite, as we ſuppoſed, ſtood behind a coarſe curtain, and ſhowed her ankles under it, loaded with ſilver rings; which, if ſhe was capable of reflection, ſhe muſt have conſidered as glittering fetters rather than ornaments; but a rational being would have preferred the condition of a wild beaſt, expoſed to perils and hunger in a foreſt, to the ſplendid miſery of being wife or miſtreſs to *Salim.*

Before we returned, *Alwi* was deſirous of ſhowing me his books; but the day was too far advanced, and I promiſed to viſit him ſome other morning. The governor however prevailed on us to ſee his palace in the country, where he invited us to dine the next day. The walk was extremely pleaſant from the town to the ſide of a rivulet, which formed in one part a ſmall pool very convenient for bathing, and thence through groves and alleys to the foot of a hill; but the dining-room was little better than an open barn, and was recommended only by the coolneſs of its ſhade. *Abdullah* would accompany us on our return to the ſhip, together with two *Muftis* who ſpoke *Arabic* indifferently, and ſeemed eager to ſee all my manuſcripts; but they were very moderately learned, and gazed with ſtupid wonder on a fine copy of the *Hamaſah*, and on other collections of ancient poetry.

Early the next morning a black meſſenger, with a tawny lad as his interpreter, came from prince *Salim*; who having broken his perſpective glaſs, wiſhed to procure another by purchaſe or barter. A polite anſwer was returned, and ſteps taken to gratify his wiſhes. As we on our part expreſſed a deſire to viſit the king at *Domoni*, the prince's meſſenger told us that his maſter would, no doubt, lend us palanquins (for there was not a horſe in the iſland) and order a ſufficient number of his vaſſals to carry us, whom we might pay for their trouble as we thought juſt. We commiſſioned him therefore to aſk that favour, and begged that all might be ready for our excurſion before ſun-riſe, that we might eſcape the heat of the noon, which, though it was the middle of winter, we had found exceſſive. The boy, whoſe name was *Combo Madi*, ſtaid with us longer than his companion: there was ſomething in his look ſo ingenuous, and in his broken *Engliſh* ſo ſimple, that we encouraged him to continue his innocent prattle. He wrote and read *Arabic* tolerably well, and ſet down at my deſire the names of ſeveral towns in the iſland, which he firſt told me was properly called *Hinzùan*. The fault of begging for whatever he liked, he had in common with the governor and other nobles, but hardly in a greater degree: his firſt petition for ſome lavender-water was readily granted; and a ſmall bottle of it was ſo acceptable to him, that if we had ſuffered him, he would have kiſſed our feet: but it was not for himſelf that he rejoiced ſo extravagantly: he told us, with tears ſtarting from his eyes, that his mother would be pleaſed with it, and the idea of her pleaſure ſeemed to fill him with rapture. Never did I ſee filial affection more warmly felt, or more tenderly and, in my opinion, unaffectedly expreſſed; yet this boy was not a favourite of the officers, who thought him artful. His mother's name, he ſaid, was *Fatima*; and he importuned us to

viſit her; conceiving, I ſuppoſe, that all mankind muſt love and admire her. We promiſed to gratify him; and having made him ſeveral preſents, permitted him to return. As he reminded me of *Aladdin* in the *Arabian* tale, I deſigned to give him that name in a recommendatory letter, which he preſſed me to write, inſtead of *St. Domingo*, as ſome *European* viſitor had ridicuouſly called him; but, ſince the alluſion would not have been generally known, and ſince the title of *Alaw'ldin*, or *eminence in faith*, might have offended his ſuperiors, I thought it adviſeable for him to keep his *African* name. A very indifferent dinner was prepared for us at the houſe of the Governor, whom we did not ſee the whole day, as it was the beginning of *Ramadan*, the *Mohammedan* lent, and he was engaged in his devotions, or made them his excuſe; but his eldeſt ſon ſat by us while we dined, together with *Muſa*, who was employed, jointly with his brother *Huſain*, as purveyor to the Captain of the frigate.

Having obſerved a very elegant ſhrub that grew about ſix feet high, in the court-yard, but was not then in flower, I learned with pleaſure, that it was *hinna*, of which I had read ſo much in *Arabian* poems, and which *European* botaniſts have ridiculouſly named *Lawſonia*. *Muſa* bruiſed ſome of the leaves, and, having moiſtened them with water, applied them to our nails and the tips of our fingers, which in a ſhort time became of a dark orange-ſcarlet. I had before conceived a different idea of this dye, and imagined that it was uſed by the *Arabs* to imitate the natural redneſs of thoſe parts in young and healthly perſons, which in all countries muſt be conſidered as a beauty:—perhaps a leſs quantity of *hinna*, or the ſame differently prepared, might have produced that effect. The old men in *Arabia* uſed the ſame dye to conceal their grey hairs, while their daughters were dyeing their

lips and gums black, to ſet off the whiteneſs of their teeth; ſo univerſal in all nations and ages are perſonal vanity and a love of diſguiſing truth; though in all caſes, the farther our ſpecies recede from nature, the farther they depart from true beauty; and men at leaſt ſhould diſdain to uſe artifice or deceit for any purpoſe or on any occaſion. If the women of rank at *Paris*, or thoſe in *London* who wiſh to imitate them, be inclined to call the *Arabs* Barbarians, let them view their own head-dreſſes and cheeks in a glaſs, and, if they have left no room for bluſhes, be inwardly at leaſt aſhamed of their cenſure.

In the afternoon I walked a long way up the mountains in a winding path, amid plants and trees no leſs new than beautiful, and regretted exceedingly that very few of them were in bloſſom, as I ſhould then have had leiſure to examine them. Curioſity led me from hill to hill; and I came at laſt to the ſources of a rivulet, which we had paſſed near to the ſhore, and from which the ſhip was to be ſupplied with excellent water. I ſaw no birds on the mountains but *Guinea-fowl*, which might have been eaſily caught: no inſects were troubleſome to me but moſquitos; and I had no fear of venomous reptiles, having been aſſured that the air was too pure for any to exiſt in it; but I was often unwillingly a cauſe of fear to the gentle and harmleſs lizard, who ran among the ſhrubs. On my return, I miſſed the path by which I had aſcended; but, having met ſome blacks laden with yams and plantains, I was by them directed to another, which led me round, through a charming grove of cocoa-trees, to the Governor's country-ſeat, where our entertainment was cloſed by a ſyllabub, which the *Engliſh* had taught the *Muſelmans* to make for them.

We received no anſwer from *Salim*; nor, indeed, expected one; ſince we took for granted that he could not but approve our intention of viſiting his father; and we went on ſhore before ſun-riſe, in full expectation of a pleaſant excurſion to *Domoni:* but we were happily diſappointed. The ſervants, at the prince's door, told us coolly, that their maſter was indiſpoſed, and, as they believed, aſleep; that he had given them no orders concerning his palanquins, and that they durſt not diſturb him. *Alwi* ſoon came to pay us his compliments, and was followed by his eldeſt ſon, *Ahmed*, with whom we walked to the gardens of the two princes *Salim* and *Hamdullah:* the ſituation was naturally good, but wild and deſolate; and, in *Salim*'s garden, which we entered through a miſerable hovel, we ſaw a convenient bathing place, well-built with ſtone, but then in great diſorder, and a ſhed, by way of ſummer-houſe, like that under which we dined at the Governor's, but ſmaller and leſs neat. On the ground there lay a kind of cradle, about ſix feet long, and a little more than one foot in breadth, made of cords twiſted in a ſort of clumſy net-work, with a long thick bambu fixed to each ſide of it: this, we heard with ſurprize, was a royal palanquin, and one of the vehicles in which we were intended to have been rocked on mens ſhoulders over the mountains. I had much converſation with *Ahmed*, whom I found intelligent and communicative: he told me that ſeveral of his countrymen compoſed ſongs and tunes; that he was himſelf a paſſionate lover of poetry and muſic; and that, if we would dine at his houſe, he would play and ſing to us. We declined his invitation to dinner, as we had made a conditional promiſe, if ever we paſſed a day at *Matſamudo*, to eat our curry with *Bana Gibu*, an honeſt man, of whom we purchaſed eggs and vegetables, and to whom ſome *Engliſhmen* had given the title of *Lord*, which made him extremely vain: we could therefore

make *Sayyad Ahmed* only a morning viſit. He ſung a hymn or two in *Arabic*, and accompanied his drawling, though pathetic, pſalmody with a kind of mandoline, which he touched with an awkward quill: the inſtrument was very imperfect, but ſeemed to give him delight. The names of the ſtrings were written on it in *Arabian* or *Indian* figures, ſimple and compounded; but I could not think them worth copying. He gave Captain *Williamſon*, who wiſhed to preſent ſome literary curioſities to the library at *Dublin*, a ſmall roll containing a hymn in *Arabic* letters, but in the language of *Mombaza*, which was mixed with *Arabic*; but it hardly deſerved examination, ſince the ſtudy of languages has little intrinſic value, and is only uſeful as the inſtrument of real knowledge, which we can ſcarce expect from the poets of the *Mozambique*. *Ahmed* would, I believe, have heard our *European* airs (I always except *French* melody) with rapture, for his favourite tune was a common *Iriſh* jig, with which he ſeemed wonderfully affected.

On our return to the beach I thought of viſiting old *Alwi*, according to my promiſe, and prince *Salim*, whoſe character I had not then diſcovered: I reſolved for that purpoſe to ſtay on ſhore alone, our dinner with *Gibu* having been fixed at an early hour. *Alwi* ſhowed me his manuſcripts, which chiefly related to the ceremonies and ordinances of his own religion; and one of them, which I had formerly ſeen in *Europe*, was a collection of ſublime and elegant hymns in praiſe of *Mohammed*, with explanatory notes in the margin. I requeſted him to read one of them after the manner of the *Arabs*; and he chanted it in a ſtrain by no means unpleaſing; but I am perſuaded that he underſtood it very imperfectly. The room, which was open to the ſtreet, was preſently crowded with viſitors, moſt of whom were *Muftis*, or *Expounders of the Law*; and *Alwi*, deſirous perhaps to diſplay

his zeal before them at the expence of good breeding, directed my attention to a paſſage in a commentary on the *Koran*, which I found levelled at the *Chriſtians*. The commentator, having related with ſome additions (but on the whole not inaccurately) the circumſtances of the temptation, puts this ſpeech into the mouth of the tempter: "Though I am unable to delude thee, yet I will miſlead, by thy means, more human creatures than thou wilt ſet right." 'Nor was this menace vain (ſays the *Mohammedan* writer); 'for the inhabitants of a region many thouſand leagues in extent, are ſtill ſo deluded by the Devil, that they impiouſly call *Iſa* the ſon of *God!* Heaven preſerve us,' he adds, 'from blaſpheming *Chriſtians* as well as blaſpheming *Jews*.'— Although a religious diſpute with thoſe obſtinate zealots would have been unreaſonable and fruitleſs, yet they deſerved, I thought, a ſlight reprehenſion, as the attack ſeemed to be concerted among them. 'The commentator,' ſaid I, 'was much to blame for paſſing ſo indiſcriminate and haſty a cenſure: the title, which gave your legiſlator and gives you ſuch offence, was often applied in *Judea* (by a bold figure agreeable to the *Hebrew* idiom, though unuſual in *Arabic*) to *angels*, to *holy men*, and even to *all mankind*, who are commanded to call *God their Father*; and in this large ſenſe the apoſtle, to the *Romans*, calls the elect the *children* of *God*, and the *Meſſiah* the *firſt-born among many brethren*; but the words *only begotten* are applied tranſcendently and incomparably to him alone*; and, as for me who believes the ſcriptures, which you alſo profeſs to believe, though you aſſert without proof that we have altered them, I cannot refuſe him an appellation, though far ſurpaſſing our reaſon, by which he is

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* Rom. viii. 29. See 1 John iii. 1. II. Barrow, 231, 232, 251.

'distinguished in the Gospel; and the believers in 'Muhammed, who expressly name him *the Messiah*, 'and pronounce him to have been born of a virgin, 'which alone might fully justify the phrase con- 'demned by this author, are themselves condemn- 'able for cavilling at words, when they cannot ob- 'ject to the substance of our faith consistently with 'their own.' The *Muselmans* had nothing to say in reply; and the conversation was changed.

I was astonished at the questions which *Alwi* put to me concerning the late peace and the independence of *America*; the several powers and resources of *Britain*, *France*, *Spain*, and *Holland*; the character and supposed views of the Emperor; the comparative strength of the *Russian*, Imperial, and *Othman* armies; and their respective modes of bringing their forces to action. I answered him without reserve, except on the state of our possessions in *India*; nor were my answers lost, for I observed, that all the company were variously affected by them, generally with amazement, often with concern, especially when I described to them the great force and admirable discipline of the *Austrian* army, and the stupid prejudices of the *Turks*, whom nothing can induce to abandon their old *Tartarian* habits; and exposed the weakness of their empire in *Africa*, and even in the more distant provinces of *Asia*. In return, he gave me clear but general information concerning the government and commerce of his island: "His coun- "try," he said, "was poor, and produced few articles "of trade; but if they could get money, *which they* "*now preferred to play-things*," these were his words, "they might easily," he added, "procure foreign "commodities, and exchange them advantageously "with their neighbours in the islands and on the "continent. Thus with a little money," said he, "we purchase muskets, powder, balls, cutlasses,

"knives, clothes, raw cotton, and other articles
"brought from *Bombay*, and with these we trade to
"*Madagascar* for the natural produce of the country
"or *dollars*, with which the *French* buy cattle,
"honey, butter, and so forth, in that island. With
"*gold*, which we receive from your ships, we can
"procure elephants teeth from the natives of *Mo-*
"*zambique*, who barter them also for ammunition
"and bars of iron; and the *Portugueze* in that
"country give us cloths of various kinds in ex-
"change for our commodities; these cloths we dis-
"pose of lucratively in the three neighbouring islands,
"whence we bring rice, cattle, a kind of bread-fruit,
"which grows in *Comara*, and *slaves*, which we buy
"also at other places to which we trade; and we
"carry on this traffic in our own vessels."

Here I could not help expressing my abhorrence of their *slave-trade*, and asked him by what law they claimed a property in rational beings, since our Creator had given our species a dominion, to be moderately exercised, over the beasts of the field and the fowls of the air, but none *to man over man*. "By no "law," answered he, "unless necessity be a law. "There are nations in *Madagascar* and in *Africa*, "who know neither *God* nor his prophet, nor *Moses*, "nor *David*, nor the *Messiah*: those nations are in "perpetual war and take many captives, whom, if "they could not sell, they would certainly kill. In-"dividuals among them are in extreme poverty, "and have numbers of children, who, if they can-"not be disposed of, must perish through hunger, "together with their miserable parents. By purchas-"ing these wretches we preserve their lives, and, "perhaps, those of many others whom our money "relieves. The sum of the argument is this: If we "buy them, they will live; if they become valuable "servants, they will live comfortably; but, if they "are not sold, they must die miserably." 'There

'may be,' ſaid I, 'ſuch caſes; but you fallaciouſly draw
'a general concluſion from a few particular inſtances;
'and this is the very fallacy which, on a thouſand
'other occaſions, deludes mankind. It is not to be
'doubted that a conſtant and gainful traffic in hu-
'man creatures foments war, in which captives are
'always made, and keeps up that perpetual enmity
'which you pretend to be the *cauſe* of a practice in
'itſelf reprehenſible, while in truth it is its *effect*. The
'ſame traffic encourages lazineſs in ſome parents,
'who might in general ſupport their families by pro-
'per induſtry, and ſeduces others to ſtifle their na-
'tural feelings. At moſt, your redemption of thoſe
'unhappy children can amount only to a perſonal
'contract implied between you, for gratitude and rea-
'ſonable ſervice on their part, for kindneſs and
'humanity on yours; but can you think your part
'performed by diſpoſing of them againſt their wills,
'with as much indifference as if you were ſelling
'cattle, eſpecially as they might become readers of the
'*Koran*, and pillars of your faith?' "The law," ſaid
he, "forbids our ſelling them, when they are be-
"lievers in the Prophet; and little children only are
"ſold; nor they often, or by all maſters." 'You,
'who believe in *Muhammed*,' ſaid I, 'are bound,
'by the ſpirit and letter of his laws, to take pains
'that they alſo may believe in him; and if you ne-
'glect ſo important a duty for ſordid gain, I do
'not ſee how you can hope for proſperity in this world,
'or for happineſs in the next.' My old friend and
the *Muftis* aſſented, and muttered a few prayers; but
probably forgot my preaching before many minutes
had paſſed.

So much time had ſlipped away in this converſa-
tion, that I could make but a ſhort viſit to Prince
Salim; and my view in viſiting him was to fix the
time of our journey to *Domoni* as early as poſſible on
the next morning. His appearance was more ſavage

than ever; and I found him in a diſpoſition to complain bitterly againſt the *Engliſh*. No acknowledgment, he ſaid, had been made for the kind attentions of himſelf and the chief men of his country to the officers and people of the *Brilliant*, though a whole year had elapſed ſince the wreck. I really wondered at the forgetfulneſs, to which alone ſuch a neglect could be imputed, and aſſured him that I would expreſs my opinion both in *Bengal* and in letters to *England*. "We have little," ſaid he, "to hope from letters; for, when we have been paid "with them inſtead of money, and have ſhewn "them on board your ſhips, we have commonly "been treated with diſdain, and often with impreca-"tions." I aſſured him, that either thoſe letters muſt have been written coldly and by very obſcure perſons, or ſhown to very ill-bred men, of whom there were too many in all nations; but that a few inſtances of rudeneſs ought not to give him a general prejudice againſt our national character. "But you," ſaid he, "are a wealthy nation, and we are indigent, "yet, though all our groves of cocoa-trees, our "fruits, and our cattle, are ever at your ſervice, you "always try to make hard bargains with us for what "you chuſe to diſpoſe of; and frequently will neither "ſell nor give thoſe things which we principally "want." 'To form,' ſaid I, 'a juſt opinion of '*Engliſhmen*, you muſt viſit us in our own iſland, 'or at leaſt *India*; here we are ſtrangers and travel-'lers: many of us have no deſign to trade in any 'country, and none of us think of trading in '*Hinzuan*, where we ſtop only for refreſhment. 'The clothes, arms, or inſtruments, which you 'may want, are commonly neceſſary or convenient 'to us; but, if *Sayyad Alwi* or his ſons were to be 'ſtrangers in our country, you would have no rea-'ſon to boaſt of ſuperior hoſpitality.' He then ſhowed me, a ſecond time, a part of an old ſilk veſt, with the ſtar of the Order of the Thiſtle, and beg-

ged me to explain the motto; expreſſing a wiſh that the order might be conferred on him by the King of *England*, in return for his good offices to the *Engliſh*. I repreſented to him the impoſſibility of his being gratified, and took occaſion to ſay, that there was more true dignity in their own native titles than in thoſe of *prince*, *duke*, and *lord*, which had been idly given them, but had no conformity to their manners or the conſtitution of their government.

This converſation not being agreeable to either of us, I changed it, by deſiring that the palanquins and bearers might be ready next morning as early as poſſible. He anſwered, that his palanquins were at our ſervice for nothing, but that we muſt pay him ten dollars for each ſet of bearers; that it was the ſtated price, and that Mr. *Haſtings* had paid it when he went to viſit the king. This, as I learned afterwards, was falſe; but, at all events, I knew that he would keep the dollars himſelf, and give nothing to the bearers, who deſerved them better, and whom he would compel to leave their cottages, and toil for his profit. Can you imagine," I replied, " that we would employ four-and-twenty men " to bear us ſo far on their ſhoulders without reward- " ing them amply? But ſince they are freemen (ſo he had aſſured me) " and not your ſlaves, we will pay " them in proportion to their diligence and good beha- " viour; and it becomes neither your dignity nor ours " to make a previous bargain." I ſhowed him an elegant copy of the *Koran*, which I deſtined for his father, and deſcribed the reſt of my preſent; but he coldly aſked, " if that was all?" Had he been king, a purſe of dry dollars would have given him more pleaſure than the fineſt or holieſt manuſcript. Finding him, in converſing on a variety of ſubjects, utterly void of intelligence or principle, I took my leave, and ſaw him no more; but promiſed to let him know for certain whether we ſhould make our intended excurſion.

We dined in tolerable comfort, and had occaſion, in the courſe of the day, to obſerve the manners of the natives in the middle rank, who are called *Banas*; all of whom have ſlaves conſtantly at work for them. We viſited the mother of *Cambomadi*, who ſeemed in a ſtation but little raiſed above indigence; and her huſband, who was a mariner, bartered an *Arabic treatiſe* on aſtronomy and navigation, which he had read, for a ſea-compaſs, of which he well knew the uſe.

In the morning I had converſed with two very old *Arabs* of *Yemen*, who had brought ſome articles of trade to *Hinzuan*; and in the afternoon I met another, who had come from *Maſkat* (where at that time there was a civil war) to purchaſe, if he could, an hundred ſtand of arms. I told them all that I loved their nation; and they returned my compliment with great warmth, eſpecially the two old men, who were near fourſcore, and reminded me of *Zohair* and *Hareth*.

So bad an account had been given me of the road over the mountains, that I diſſuaded my companions from thinking of the journey, to which the captain became rather diſinclined; but as I wiſhed to be fully acquainted with a country which I might never ſee again, I wrote the next day to *Salim*, requeſting him to lend me one palanquin, and to order a ſufficient number of men. He ſent me no written anſwer, which I aſcribe rather to his incapacity than to rudeneſs; but the Governor, with *Alwi* and two of his ſons, came on board in the evening, and ſaid that they had ſeen my letter; that all ſhould be ready; but that I could not pay leſs for the men than ten dollars. I ſaid I would pay more, but it ſhould be to the men themſelves, according to their behaviour. They returned ſomewhat diſſatisfied, after I had played at cheſs

with *Alwi*'s younger ſon, in whoſe manner and addreſs there was ſomething remarkably pleaſing.

Before ſun-riſe, on the 2d of *Auguſt*, I went alone on ſhore, with a ſmall baſket of ſuch proviſions as I might want in the courſe of the day, and with ſome cuſhions to make the prince's palanquin at leaſt a tolerable vehicle; but the prince was reſolved to receive the dollars to which his men were entitled; and he knew that, as I was eager for the journey, he could preſcribe his own terms. Old *Alwi* met me on the beach, and brought excuſes from *Salim*, who he ſaid was indiſpoſed. He conducted me to his houſe, and ſeemed rather deſirous of perſuading me to abandon my deſign of viſiting the king; but I aſſured him that, if the prince would not ſupply me with proper attendants, I would walk to *Domoni* with my own ſervants and a guide. *Shaikh Salim*, he ſaid, was miſerably avaricious, and that he was aſhamed of a kinſman with ſuch a diſpoſition; but that he was no leſs obſtinate than covetous; and that, without ten dollars paid in hand, it would be impoſſible to procure bearers. I then gave him three guineas, which he carried, or pretended to carry to *Salim*; but returned without the change, alleging that he had no ſilver, and promiſing to give me on my return the few dollars that remained. In about an hour the ridiculous vehicle was brought by nine ſturdy blacks, who could not ſpeak a word of *Arabic*, ſo that I expected no information concerning the country through which I was to travel; but *Alwi* aſſiſted me in a point of the utmoſt conſequence. 'You cannot go,' ſaid he, 'without an interpreter, for the king ſpeaks only 'the language of this iſland; but I have a ſervant, 'whoſe name is *Tumuni*, a ſenſible and worthy man, 'who underſtands *Engliſh*, and is much eſteemed 'by the king; he is known and valued all over

'*Hinzuan.* This man ſhall attend you; and you 'will ſoon be ſenſible of his worth.'

Tumuni deſiſted to carry my baſket; and we ſet out with a proſpect of fine weather, but ſome hours later than I had intended. I walked by the gardens of the two princes, to the ſkirts of the town, and came to a little village conſiſting of ſeveral very neat huts, made chiefly with the leaves of the cocoa-tree; but the road a little farther was ſo ſtony, that I ſat in the palanquin, and was borne with perfect ſafety over ſome rocks. I then deſired my guide to aſſure the men that I would pay them liberally; but the poor peaſants, who had been brought from their farms on the hills, were not perfectly acquainted with the uſe of money, and treated my promiſe with indifference.

About five miles from *Matſamudo* lies the town of *Wani*, where *Shaikh Abdullah*, who has already been mentioned, uſually reſides: I ſaw it at a diſtance, and it ſeemed to be agreeably ſituated. When I had paſſed the rocky part of the road, I came to a ſtony beach, where the ſea appeared to have loſt ſome ground, ſince there was a fine ſand to the left, and beyond it a beautiful bay, which reſembled that of *Weymouth*, and ſeemed equally convenient for bathing; but it did not appear to me that the ſtones over which I was carried had been recently covered with water. Here I ſaw the frigate, and, taking leave of it for two days, turned from the coaſt into a fine country very neatly cultivated, and conſiſting partly of hillocks exquiſitely green, partly of plains, which were then in a gaudy dreſs of rich yellow bloſſoms. My guide informed me they were plantations of a kind of vetch, which was eaten by the natives. Cottages and farms were interſperſed all over this gay champaign, and the whole ſcene was delightful: but it was ſoon changed for beauties of a different kind.

We deſcended into a cool valley, through which ran a rivulet of perfectly clear water; and there, finding my vehicle uneaſy, though from the laughter and merriment of my bearers I concluded them to be quite at their eaſe, I bade them ſet me down, and walked before them all the reſt of the way. Mountains, clothed with fine trees and flowering-ſhrubs, preſented themſelves on our aſcent from the vale; and we proceeded for half an hour through pleaſant wood-walks, where I regretted the impoſſibility of loitering a while to examine the variety of new bloſſoms, which ſucceeded one another at every ſtep, and the virtues, as well as names, of which ſeemed familiar to *Tumuni*. At length we deſcended into a valley of greater extent than the former: a river or large wintery torrent ran through it, and fell down a ſteep declivity at the end of it, where it ſeemed to be loſt among rocks. Cattle were grazing on the banks of the river, and the huts of their owners appeared on the hills: a more agreeable ſpot I had not before ſeen even in *Swiſſerland* or *Merionethſhire*; but it was followed by an aſſemblage of natural beauties, which I hardly expected to find in a little iſland twelve degrees to the ſouth of the Line. I was not ſufficiently pleaſed with my ſolitary journey to diſcover charms which had no actual exiſtence, and the firſt effect of the contraſt between *St. Jago* and *Hinzuan* had ceaſed; but, without any diſpoſition to give the landſcape a high colouring, I may truly ſay, what I thought at the time, that the whole country which next preſented itſelf, as far ſurpaſſed *Ermenonville*, or *Blenheim*, or any other imitations of nature, which I had ſeen in *France* or *England*, as the fineſt bay ſurpaſſes an artificial piece of water. Two very high mountains, covered to the ſummit with the richeſt verdure, were at ſome diſtance on my right hand, and ſeparated from me by meadows diverſified with cottages and herds, or by vallies reſounding with tor-

rents and waterfalls; on my left was the ſea, to which there were beautiful openings from the hills and woods; and the road was a ſmooth path naturally winding through a foreſt of ſpicy ſhrubs, fruit-trees, and palms. Some high trees were ſpangled with white bloſſoms, equal in fragrance to orange-flowers: my guide called them *Monongos*; but the day was declining ſo faſt, that it was impoſſible to examine them: the variety of fruits, flowers, and birds, of which I had a tranſient view in this magnificent garden, would have ſupplied a naturaliſt with amuſment for a month; but I ſaw no remarkable inſect, and no reptile of any kind. The woodland was diverſified by a few pleaſant glades, and new proſpects were continually opened: at length a noble view of the ſea burſt upon me unexpectedly; and, having paſſed a hill or two, we came to the beach, beyond which were ſeveral hills and cottages. We turned from the ſhore; and, on the next eminence, I ſaw the town of *Domoni* at a little diſtance below us. I was met by a number of natives, a few of whom ſpoke *Arabic*; and thinking it a convenient place for repoſe, I ſent my guide to apprize the king of my intended viſit. He returned in half an hour with a polite meſſage; and I walked into the town, which ſeemed large and populous. A great crowd accompanied me; and I was conducted to a houſe built on the ſame plan with the beſt houſes at *Matſamudo*. In the middle of the court-yard ſtood a large *Monongo tree*, which perfumed the air; the apartment on the left was empty; and in that on the right ſat the king on a ſofa or bench, covered with an ordinary carpet. He roſe when I entered, and graſping my hands, placed me near him on the right; but as he could ſpeak only the language of *Hinzuan*, I had recourſe to my friend *Tumuni*, than whom a readier or more accurate interpreter could not have been found. I preſented the king with a very handſome *Indian* dreſs of blue ſilk with golden flowers,

which had been worn only once at a masquerade, and with a beautiful copy of the *Koran*, from which I read a few verses to him. He took them with great complacency, and said, he wished I had come by sea, that he might have loaded one of my boats with fruit, and with some of his finest cattle. He had seen me, he said, on board the frigate, where he had been, according to his custom, in disguise, and had heard of me from his son *Shaikh Hamdullah*. I gave him an account of my journey, and extolled the beauties of his country: he put many questions concerning mine, and professed great regard for our nation. "But I hear," said he, "that you are "a magistrate, and consequently profess peace: why "are you armed with a broad sword?" 'I was a 'man,' I said, 'before I was a magistrate; and, if it 'should ever happen that law could not protect 'me, I must protect myself.' He seemed about sixty years old, had a very cheerful countenance, and great appearance of good-nature mixed with a certain dignity, which distinguished him from the crowd of ministers and officers who attended him. Our conversation was interrupted by notice, that it was the time of evening-prayers; and, when he rose, he said "this house is yours, and I will visit you in it, after "you have taken some refreshment." Soon after, his servants brought a roast fowl, a rice-pudding, and some other dishes, with papayas and very good pomegranates; my own basket supplied the rest of my supper. The room was hung with old red cloth, and decorated with pieces of porcelain and festoons of *English* bottles; the lamps were placed on the ground in large sea-shells; and the bed-place was a recess, concealed by a chintz hanging, opposite to the sofa, on which we had been sitting. Though it was not a place that invited repose, and the gnats were inexpressibly troublesome, yet the fatigue of the day procured me very comfortable slumber. I was waked

by the return of the king and his train; ſome of whom were *Arabs*, for I heard one of them ſay *huwa-rakid*, or, *he is ſleeping*. There was immediate ſilence, and I paſſed the night with little diſturbance, except from the unwelcome ſongs of the moſquitos. In the morning all was equally ſilent and ſolitary; the houſe appeared to be deſerted; and I began to wonder what had become of *Tumuni:* he came at length with concern on his countenance, and told me that the bearers had run away in the night; but that the king, who wiſhed to ſee me in another of his houſes, would ſupply me with bearers, if he could not prevail on me to ſtay till a boat could be ſent for. I went immediately to the king, whom I found ſitting on a raiſed ſofa in a large room, the walls of which were adorned with ſentences from the *Koran*, in very legible characters: about fifty of his ſubjects were ſeated on the ground in a ſemicircle before him; and my interpreter to his place in the midſt of them. The good old king laughed heartily, when he heard the adventure of the night, and ſaid, "you will now be my "gueſt for a week, I hope; but, ſeriouſly, if you "muſt return ſoon, I will ſend into the country for "ſome peaſants to carry you." He then apologized for the behaviour of *Shaikh Salim*, which he had heard from *Tumuni*, who told me afterwards that he was much diſpleaſed with it, and would not fail to expreſs his diſpleaſure. He concluded with a long harangue on the advantage which the *Engliſh* might derive from ſending a ſhip every year from *Bombay* to trade with his ſubjects, and on the wonderful cheapneſs of their commodities, eſpecially of their cowries. Ridiculous as this idea might ſeem, it ſhowed an enlargement of mind, a deſire of promoting the intereſt of his people, and a ſenſe of the benefits ariſing from trade, which could hardly have been expected from a petty *African* chief; and which, if he had

been ſovereign of *Yemen*, might have been expanded into rational projects proportioned to the extent of his dominions. I anſwered, that I was imperfectly acquainted with the commerce of *India*; but that I would report the ſubſtance of his converſation, and would ever bear teſtimony of his noble zeal for the good of his country, and to the mildneſs with which he governed it. As I had no inclination to paſs a ſecond night in the iſland, I requeſted leave to return without waiting for bearers: he ſeemed very ſincere in preſſing me to lengthen my viſit, but had too much *Arabian* politeneſs to be importunate. We therefore parted; and at the requeſt of *Tumuni*, who aſſured me that little time would be loſt in ſhowing attention to one of the worthieſt men in *Hinzuan*, I made a viſit to the Governor of the town, whoſe name was *Mutekka:* his manners were very pleaſing, and he ſhowed me ſome letters from the officers of the *Brilliant*, which appeared to flow warm from the heart, and contained the ſtrongeſt *eloge* of his courteſy and liberality. He inſiſted on filling my baſket with ſome of the fineſt pomegranates I had ever ſeen; and I left the town, impreſſed with a very favourable opinion of the king and his governor. When I reaſcended the hill, attended by many of the natives, one of them told me in *Arabic*, that I was going to receive the higheſt mark of diſtinction that it was in the king's power to ſhow me; and he had ſcarce ended, when I heard the report of a ſingle gun: *Shaikh Ahmed* had ſaluted me with the whole of his ordnance I waved my hat, and ſaid *Allah Acber:* the people ſhouted, and I continued my journey, not without fear of inconvenience from exceſſive heat, and the fatigue of climbing rocks. The walk, however, was not on the whole unpleaſant: I ſometimes reſted in the valleys, and forded all the rivulets, which refreſhed me with

their coolneſs, and ſupplied me with exquiſite water to mix with the juice of my pomegranates, and occaſionally with brandy. We were overtaken by ſome peaſants, who came from the hills by a nearer way, and brought the king's preſent of a cow with her calf, and a ſhe-goat with two kids: they had apparently been ſelected for their beauty, and were brought ſafe to *Bengal*. The proſpects, which had ſo greatly delighted me the preceding day, had not loſt their charms, though they wanted the recommendation of novelty; but I muſt confeſs, that the moſt delightful object in that day's walk, of near ten miles, was the Black Frigate, which I diſcerned at ſunſet from a rock near the prince's gardens. Cloſe to the town I was met by a native, who, perceiving me to be weary, opened a very fine cocoa-nut, which afforded a delicious draught: he informed me, that one of his countrymen had been puniſhed that afternoon for a theft on board the *Crocodile*; and added, that, in his opinion, the puniſhment was no leſs juſt than the offence was diſgraceful to his country. The offender, as I afterwards learned, was a youth of good family, who had married a daughter of old *Alwi*, but, being left alone for a moment in the cabin, and ſeeing a pair of blue Morocco ſlippers, could not reſiſt the temptation, concealed them ſo ill under his gown, that he was detected with the mainer. This proves, that no principle of honour is inſtilled by education into the gentry of this iſland: even *Alwi*, when he had obſerved that, "in the month of *Ramadan*, it was "not lawful to paint with *hinna*, or to tell *lies*;" and when I aſked, whether both were lawful all the reſt of the year, anſwered, that "lies were innocent, if no "man was injured by them." *Tumuni* took his leave, as well ſatisfied as myſelf with our excurſion. I told him, before his maſter, that I transferred alſo to him the dollars, which were due to me out of the three guineas; and that, if ever they ſhould part, I would

be very glad to receive him into my ſervice in *India*. Mr. *Roberts*, the maſter of the ſhip, had paſſed the day with *Sayyad Ahmed*, and had learned from him a few curious circumſtances concerning the government of *Hinzuan*; which he found to be a monarchy limited by ariſtocracy. The king, he was told, had no power of making war by his own authority; but, if the aſſembly of nobles, who were from time to time convened by him, reſolved on a war with any of the neighbouring iſlands, they defrayed the charges of it by voluntary contributions; in return for which they claimed as their own all the booty and captives that might be taken. The hope of gain or the want of ſlaves is uſually the real motives for ſuch enterprizes, and oſtenſible pretexts are eaſily found. At that very time he underſtood they meditated a war, becauſe they wanted hands for the following harveſt. Their fleet conſiſted of ſixteen or ſeventeen ſmall veſſels, which they manned with about two thouſand five hundred iſlanders, armed with muſkets and cutlaſſes, or with bows and arrows. Near two years had elapſed before they had poſſeſſed themſelves of two towns in *Mayata*, which they ſtill kept and garriſoned. The ordinary expences of the government were defrayed by a tax from two hundred villages; but the three principal towns were exempt from all taxes, except that they paid annually to the chief *Mufti* a fortieth part of the value of all their moveable property; and from that payment neither the king nor the nobles claimed an exemption. The kingly authority, by the principles of their conſtitution, was conſidered elective, though the line of ſucceſſion had not been altered ſince the firſt election of a ſultan. He was informed that a wandering *Arab*, who had ſettled in the iſland, had, by his intrepidity in ſeveral wars, acquired the rank of a chieftain, and afterwards of a king with limited powers; and that he was the *grandfather* of *Shaikh Ahmed*. I had been aſſured that Queen

Halimah was his *grandmother*; and, that he was the *ſixth* king; but it muſt be remarked, that the words *jedd* and *jeddah* in *Arabic* are uſed for a male and female *anceſtor* indefinitely: and without a correct pedigree of *Ahmed's* family, which I expected to procure, but was diſappointed, it would ſcarce be poſſible to aſcertain the time when his forefather obtained the higheſt rank in the government. In the year 1000, Captain *John Davis*, who has written an account of his voyage, found *Mayata* governed by a king, and *Anſuame*, or *Hinzuan*, by a queen, who ſhowed him great marks of friendſhip. He anchored before the town of *Demos* (does he mean *Domoni?*) which was as large, he ſays, as *Plymouth*; and he concludes, from the ruins around it, that it had once been a place of ſtrength and grandeur. I can only ſay, that I obſerved no ſuch ruins. Fifteen years after, Captain *Peyton* and Sir *Thomas Roe* touched at the *Comara* iſlands; and, from their ſeveral accounts, it appears that an old ſultaneſs at that time reſided in *Hinzuan*, but had a dominion paramount over all the iſles, three of her ſons governing *Mohila* in her name. If this be true, *Sohaili* and the ſucceſſors of *Halimah* muſt have loſt their influence over the other iſlands; and, by renewing their dormant claim as it ſuits their convenience, they may always be furniſhed with a pretence for hoſtilities. Five generations of eldeſt ſons would account for an hundred and ſeventy of the years which have elapſed ſince *Davis* and *Peyton* found *Hinzuan* ruled by a ſultaneſs; and *Ahmed* was of ſuch an age, that his reign may be reckoned equal to a generation. It is probable, on the whole, that *Halimah* was the widow of the firſt *Arabian* king, and that her moſque has been continued in repair by his deſcendants; ſo that we may reaſonably ſuppoſe two centuries to have paſſed ſince a ſingle *Arab* had the courage and addreſs to eſtabliſh in that beautiful iſland a form of government, which,

though bad enough in itſelf, appears to have been adminiſtered with advantage to the original inhabitants. We have lately heard of civil commotions in *Hinzuan*, which, we may venture to pronounce, were not excited by any cruelty or violence of *Ahmed*, but were probably occaſioned by the inſolence of an oligarchy naturally hoſtile to king and people. That the mountains in the *Comara* iſlands contain diamonds, and the precious metals, which are ſtudiouſly concealed by the policy of the ſeveral governments, may be true, though I have no reaſon to believe it, and have only heard it aſſerted without evidence; but I hope that neither an expectation of ſuch treaſures, nor of any other advantage, will ever induce an *European* power to violate the firſt principles of juſtice by aſſuming the ſovereignty of *Hinzuan*, which cannot anſwer a better purpoſe than that of ſupplying our fleets with ſeaſonable refreſhment; and, although the natives have an intereſt in receiving us with apparent cordiality, yet, if we wiſh their attachment to be unfeigned and their dealings juſt, we muſt ſet them an example of ſtrict honeſty in the performance of our engagements. In truth, our nation is not cordially loved by the inhabitants of *Hinzuan*, who, as it commonly happens, form a general opinion from a few inſtances of violence or breach of faith.—Not many years ago, an *European*, who had been hoſpitably received and liberally ſupported at *Matſamudo*, behaved rudely to a young married woman, who, being of low degree, was walking veiled through a ſtreet in the evening. Her huſband ran to protect her, and reſented the rudeneſs, probably with menaces, poſſibly with actual force; and the *European* is ſaid to have given him a mortal wound with a knife or bayonet, which he brought, after the ſcuffle, from his lodging. This foul murder, which the law of nature would have juſtified the magiſtrate in puniſhing with death, was reported

to the king, who told the governor (and I uſe the very words of *Alwi*) that " it would be wiſer to huſh it up."—*Alwi* mentioned a civil caſe of his own, which ought not to be concealed. When he was on the coaſt of *Africa*, in the dominions of a very ſavage prince, a ſmall *European* veſſel was wrecked; and the prince not only ſeized all that could be ſaved from the wreck, but claimed the captain and the crew as his ſlaves, and treated them with ferocious inſolence. *Alwi* aſſured me, that, when he heard of the accident, he haſtened to the prince, fell proſtrate before him, and by tears and importunity prevailed on him to give the *Europeans* their liberty; that he ſupported them at his own expence, enabled them to build another veſſel, in which they ſailed to *Hinzuan*, and departed thence for *Europe* or *India*. He ſhowed me the Captain's promiſſory notes for ſums, which to an *African* trader muſt be a conſiderable object, but which are no price for liberty, ſafety, and, perhaps, life, which his good though diſintereſted offices had procured. I lamented that, in my ſituation, it was wholly out of my power to aſſiſt *Alwi* in obtaining juſtice; but he urged me to deliver an *Arabic* letter from him, incloſing the notes, to the Governor General, who, as he ſaid, knew him well: and I complied with his requeſt. Since it is poſſible that a ſubſtantial defence may be made by the perſon thus accuſed of injuſtice, I will not name either him or the veſſel which he had commanded; but, if he be living, and if this paper ſhould fall into his hands, he may be induced to reflect how highly it imports our national honour, that a people whom we call ſavage, but who adminiſter to our convenience, may have no juſt cauſe to reproach us with a violation of our contracts.

VI.

ON THE BAYA, OR INDIAN GROSS-BEAK.

BY AT'HAR ATI KHAN OF DEHLI.

THE little bird, called *Baya* in *Hindi*, *Berbera* in *Sanscrit*, *Babui* in the dialect of *Bengal*, *Cibu* in *Persian*, and *Tenawwit* in *Arabic*, from his remarkably *pendent* nest, is rather larger than a sparrow, with yellow-brown plumage, a yellowish head and feet, a light coloured breast, and a conic beak, very thick in proportion to his body. The bird is exceedingly common in *Hindustan*: he is astonishingly sensible, faithful, and docile, never voluntarily deserting the place where his young were hatched, nowise averse, like most other birds, to the society of mankind, and easily taught to perch on the hand of his master. In a state of nature he generally builds his nest on the highest tree that he can find, especially on the Palmyra, or on the *Indian* fig-tree; and he prefers that which happens to overhang a well or a rivulet: he makes it of grass, which he weaves like cloth, and shapes like a large bottle, suspending it firmly on the branches, but so as to rock with the wind; and placing it with its entrance downwards, to secure it from birds of prey. His nest usually consists of two or three chambers; and it is the popular belief that he lights them with fire-flies, which he catches alive at night and confines with moist clay, or with cow-dung. That such flies are often found in his nest, where pieces of cow-dung are also stuck, is indubitable; but, as their light could be of little use to him, it seems probable that he only feeds on them. He may be taught with ease to fetch a piece of paper,

or any ſmall thing that his maſter points out to him. It is an atteſted fact, that, if a ring be dropped into a deep well, and a ſignal given to him, he will fly down with amazing celerity, catch the ring before it touches the water, and bring it up to his maſter with apparent exultation; and it is confidently aſſerted, that, if a houſe or any other place be ſhown to him once or twice, he will carry a note thither immediately on a proper ſignal being made. One inſtance of his docility I can myſelf mention with confidence, having often been an eye-witneſs of it: The young *Hindu*-women at *Banares* and in other places, wear very thin plates of gold, called *ticas*, ſlightly fixed, by way of ornament, between their eye-brows; and, when they paſs through the ſtreets, it is not uncommon for the youthful libertines, who amuſe themſelves with training *Bayas*, to give them a ſign, which they underſtand, and ſend them to pluck the pieces of gold from the foreheads of their miſtreſſes, which they bring in triumph to the lovers.—The *Baya* feeds naturally on graſshoppers and other inſects, but will ſubſiſt, when tame, on pulſe macerated in water. His fleſh is warm and drying, of eaſy digeſtion, and recommended, in medical books, as a ſolvent of ſtone in the bladder or kidneys; but of that virtue there is no ſufficient proof. The female lays many beautiful eggs, reſembling large pearls: the white of them, when they are boiled, is tranſparent, and the flavour of them is exquiſitely delicate. When many *Bayas* are aſſembled on a high tree, they make a lively din, but it is rather chirping than ſinging; their want of muſical talents is, however, amply ſuppled by their wonderful ſagacity, in which they are not excelled by any feathered inhabitants of the foreſt.

VII.

ON THE CHRONOLOGY OF THE HINDUS.

WRITTEN IN JANUARY, 1788,

BY THE PRESIDENT.

THE great antiquity of the *Hindus* is believed ſo firmly by themſelves, and has been the ſubject of ſo much converſation among *Europeans*, that a ſhort view of their Chronological Syſtem, which has not yet been exhibited from certain authorities, may be acceptable to thoſe who ſeek truth without partiality to received opinions, and without regarding any conſequences that may reſult from their inquiries. The conſequences, indeed, of truth cannot but be deſireable, and no reaſonable man will apprehend any danger to ſociety from a general diffuſion of its light; but we muſt not ſuffer ourſelves to be dazzled by a falſe glare, nor miſtake enigmas and allegories for hiſtorical verity. Attached to no ſyſtem, and as much diſpoſed to reject the *Moſaic* hiſtory, if it be proved erroneous, as to believe it, if it be confirmed by ſound reaſoning from indubitable evidence, I propoſe to lay before you a conciſe account of *Indian* Chronology, extracted from *Sanſcrit* books, or collected from converſation with *Pandits*, and to ſubjoin a few remarks on their ſyſtem, without attempting to decide a queſtion, which I ſhall venture to ſtart, "Whether it is not in fact the ſame with our "own, but embelliſhed and obſcured by the fancy "of their poets and the riddles of their aſtro-"nomers?"

One of the moſt curious books in *Sanſcrit*, and one of the oldeſt after the *Vedas*, is a tract on *religious and civil duties*, taken, as it is believed, from the oral inſtructions of *Menu*, ſon of *Brahma*, to the firſt inhabitants of the earth. An exceeding well-collated copy of this moſt intereſting law-tract is now before me; and I begin my diſſertation with a few couplets from the firſt chapter of it: "The ſun "cauſes the diviſion of day and night, which are "of two ſorts, thoſe of men and thoſe of the "Gods; the day, for the labour of *all* creatures in "their ſeveral employments: the night for their "ſlumber. A month is a day and night of the "patriarchs; and it is divided into two parts; the "bright half is *their* day for laborious exertions; the "dark half, *their* night for ſleep. A year is a day "and night of the Gods; and that is alſo divided "into two halves; the day is, when the ſun moves "toward the north; the night, when it moves to-"ward the ſouth. Learn now the duration of a "night and day of *Brahma* with that of the ages "reſpectively, and in order. Four thouſand years "*of the Gods* they call the *Crita* (or *Satya*) age; "and its limits at the beginning and at the end *are*, "in like manner, as many hundreds. In the three "ſucceſſive ages, together with their limits at the "beginning and end of them, are thouſands and "hundreds diminiſhed by one. This aggregate of "four ages, amounting to twelve thouſand divine "years, is called an age of the Gods; and a thou-"ſand ſuch divine ages added together, muſt be con-"ſidered as a day of *Brahma*: his night has alſo the "ſame duration. The before-mentioned age of the "Gods, or twelve thouſand of their years, multi-"plied by ſeventy-one, form what is named here "below a *Manwantara*. There are *alternate* crea-"tions and deſtructions *of worlds* through innumer-"able *Manwantaras*: the Being ſupremely deſir-"able, performs all this again and again."

Such is the arrangement of infinite time, which the *Hindus* believe to have been revealed from Heaven, and which they generally underſtand in a literal ſenſe: it ſeems to have intrinſic marks of being purely aſtronomical; but I will not appropriate the obſervations of others, nor anticipate thoſe in particular, which have been made by two or three of our members, and which they will, I hope, communicate to the Society. A conjecture, however, of Mr. *Paterſon* has ſo much ingenuity in it, that I cannot forbear mentioning it here, eſpecially as it ſeems to be confirmed by one of the couplets juſt cited: he ſuppoſes, that as a *month* of mortals is a day and night of the patriarchs, from the analogy of its bright and dark halves, ſo, by the ſame analogy, a day and a night of mortals might have been conſidered by the ancient *Hindus* as a month of the lower world; and then a year of ſuch months will conſiſt only of twelve days and nights, and thirty ſuch years will compoſe a lunar year of mortals; whence he ſurmiſes that the *four million three hundred and twenty thouſand* years, of which the four *Indian* ages are ſuppoſed to conſiſt, mean only years of twelve days; and, in fact, that ſum divided by *thirty*, is reduced to *an hundred and forty-four thouſand:* now *a thouſand four hundred and forty* years are one *pada*, a period in the *Hindu* aſtronomy; and that ſum multiplied by *eighteen*, amounts preciſely to *twenty-five thouſand nine hundred and twenty*, the number of years in which the fixed ſtars appear to perform their long revolution eaſtward. The laſt mentioned ſum is the product alſo of *an hundred and forty-four*, which, according to M. *Bailly*, was an old *Indian* cycle, into *an hundred and eighty*, or the *Tartarian* period, called *Van*, and of *two thouſand eight hundred and eighty* into *nine*, which is not one only of the lunar cycles, but conſidered by the *Hindus* as a myſterious number, and an emblem of Divinity, becauſe, if it be multiplied by any other

whole number, the ſum of the figures in the different products remain always nine, as the Deity, who appears in many forms, continues One immutable eſſence. The important period of *twenty-five thouſand nine hundred and twenty* years, is well known to ariſe from the multiplication of *three hundred and ſixty* into *ſeventy-two*, the number of years in which a fixed ſtar ſeems to move through a degree of a great circle; and, although M. *Le Gentil* aſſures us that the modern *Hindus* believe a complete revolution of the ſtars to be made in *twenty-four thouſand* years, or *fifty-four* ſeconds of a degree to be paſſed in one year, yet we may have reaſon to think that the old *Indian* aſtronomers had made a more accurate calculation, but concealed their knowledge from the people under the veil of *fourteen Manwantaras*, *ſeventy-one* divine ages, compound cycles, and years of different ſorts, from thoſe of *Brahma* to thoſe of *Patala*, or the *infernal regions*. If we follow the analogy ſuggeſted by *Menu*, and ſuppoſe only a day and night to be called *a year*, we may divide the number of years in a divine age by *three hundred and ſixty*, and the quotient will be *twelve thouſand*, or the number of his *divine years* in one age: but, conjecture apart, we need only compare the two periods 4320000 and 25920, and we ſhall find, that among their common diviſors, are 6, 9, 12, &c. 18, 36, 72, 144, &c.; which numbers with their ſeveral multiples, eſpecially in a decuple progreſſion, conſtitute ſome of the moſt celebrated periods of the *Chaldeans*, *Greeks*, *Tartars*, and even of the *Indians*. We cannot fail to obſerve, that the number 432, which appears to be the baſis of the *Indian* ſyſtem, is a 60th part of 25920, and, by continuing the compariſon we might probably ſolve the whole enigma. In the preface to a *Varanes* Almanac, I find the following wild ſtanza: "A *thouſand* Great Ages are a day of "*Brahma*; a *thouſand* ſuch days are an *Indian* hour

" of *Viſhnu*; *ſix hundred thouſand* ſuch hours make
" a period of *Rudra*; and a million of *Rudras*
" (or *two quadrillions five hundred and ninety-two*
" *thouſand trillions of lunar years)* are but a *ſecond*
" to the Supreme Being." The *Hindu* theologians deny the concluſion of the ſtanza to be orthodox: "*Time*," they ſay, "*exiſts not at all with God*;" and they adviſe aſtronomers to mind their own buſineſs, without meddling with theology. The aſtronomical verſe, however, will anſwer our preſent purpoſe: for it ſhows, in the firſt place, that cyphers are added at pleaſure to ſwell the periods; and, if we take ten cyphers from a *Rudra*, or divide by ten thouſand millions, we ſhall have a period of 259200000 years, which, divided by 60 (the uſual diviſor of *time* among the *Hindus*) will give 4320000, or a Great Age, which we find ſubdivided in the proportion of 4, 3, 2, 1, from the notion of *virtue* decreaſing arithmetically in the *golden*, *ſilver*, *copper*, and *earthen* ages. But, ſhould it be thought improbable that the *Indian* aſtronomers in very early times had made more accurate obſervations than thoſe of *Alexandria*, *Bagdad*, or *Maraghah*, and ſtill more improbable that they ſhould have relapſed with apparent cauſe into error, we may ſuppoſe that they formed their divine age by an arbitrary multiplication of 24000 by 180, according to *Le Gentil*, or of 21600 by 200, according to the comment on the *Surya Siddhanta*. Now, as it is *hardly* poſſible that ſuch coincidences ſhould be accidental, we may hold it *nearly* demonſtrated, that the period of a *divine age* was at firſt merely aſtronomical, and may conſequently reject it from our preſent inquiry into the hiſtorical or civil chronology of *India*. Let us, however, proceed to the avowed opinions of the *Hindus*, and ſee, when we have aſcertained their ſyſtem, whether we can reconcile it to the courſe of nature and the common ſenſe of mankind.

The aggregate of their four ages they call a divine age, and believe that, in every thouſand ſuch ages, or in every *day* of *Brahma*, *fourteen Menas* are ſucceſſively inveſted by him with the ſovereignty of the earth: each *Menu*, they ſuppoſe, tranſmits his empire to his ſons and grandſons during a period of ſeventy-one divine ages; and ſuch a period they name a *Manwantara*; but, ſince *fourteen* multiplied by *ſeventy-one* are not quite a *thouſand*, we muſt conclude that *ſix divine ages* are allowed for intervals between the *Manwantaras*, or for the twilight of *Brahma*'s day. Thirty ſuch days, or *Calpas*, conſtitute, in their opinion, *a month* of *Brahma*; twelve ſuch months, one of his years; and an hundred ſuch years, his *age*; of which age, they aſſert that fifty years have elapſed. We are now then, according to the *Hindus*, in the firſt day or *Calpa* of the firſt month of the fifty-firſt year of *Brahma*'s age, and in the twenty-eighth divine age of the ſeventh *Manwantara*; of which divine age the *three firſt* human ages have paſſed, and *four thouſand eight hundred and eighty-eight* of the *fourth*.

In the preſent day of *Brahma* the firſt *Menu* was ſurnamed *Swayambhuva*, or *ſon of the ſelf-exiſtent*; and it is he by whom the *inſtitutes of religious and civil duties* are ſuppoſed to have been delivered. In his time the Deity deſcended at a *ſacrifice*, and, by his wife *Satarupa*, he had two diſtinguiſhed ſons, and three daughters. This pair were created for the multiplication of the human ſpecies, after that new creation of the world which the *Brahmans* call *Padmacalpiya*, or the *Lotos*-creation.

If it were worth while to calculate the age of *Menu*'s inſtitutes, according to the *Brahmans*, we muſt multiply four million three hundred and twenty thouſand by ſix times ſeventy-one, and add to the

product the number of years already past in the seventh *Manwantara.* Of the five *Menus* who succeeded him, I have seen little more than the names; but the *Hindu* writings are very diffuse on the life and posterity of the *seventh Menu*, surnamed *Vaivaswata*, or *Child of the Sun:* he is supposed to have had ten sons, of whom the eldest was *Icshwacu*; and to have been accompanied by seven *Rishis*, or holy persons, whose names were, *Casyapa*, *Atri*, *Vasishtha*, *Viswamitra*, *Gautama*, *Jamadagni*, and *Bharadwaja*; an account which explains the opening of the fourth chapter of the *Gita:* "This immutable system of devotion," says *Crishna*, "I revealed to *Vivaswat, or the Sun*; *Vivaswat* declared it to *his son Menu*; *Menu* explained it to *Icshwacu:* thus the chief *Rishis* know this sublime *doctrine*, delivered from one to another."

In the reign of this *sun-born* monarch, the *Hindus* believe the whole earth to have been drowned, and the whole human race destroyed by a flood, except the pious prince himself, the seven *Rishis*, and their several wives; for they suppose his children to have been born after the deluge. This general *praylaya*, or destruction, is the subject of the first *Purana*, or *sacred poem*, which consists of fourteen thousand stanzas; and the story is concisely, but clearly and elegantly, told in the eighth book of the *Bhagawata*, from which I have abstracted the whole, and translated it with great care; but will only present you here with an abridgment of it. "The demon *Hayagriva* having purloined the *Vedas* from the custody of *Brahma*, while he was reposing at the close of the sixth *Manwantara*, the whole race of men became corrupt, except the seven *Rishis* and *Satyavata*, who then reigned

" in *Dravira*, a maritime region to the south of
" *Carnata*: this prince was performing his ablutions
" in the river *Critamala* when *Vishnu* appeared to
" him in the shape of a small fish, and, after seve-
" ral augmentations of bulk in different waters,
" was placed by *Satyavrata* in the ocean, where
" he thus addressed his amazed votary: " In *seven*
" days all creatures, who have offended me, shall be
" destroyed by a deluge, but thou shalt be secured
" in a capacious vessel, miraculously formed: take
" therefore all kinds of medicinal herbs and esculent
" grain for food, and, together with the seven holy
" men, your respective wives, and pairs of all ani-
" mals, enter the ark without fear; then shalt thou
" know God face to face, and all thy questions shall
" be answered." Saying this, he disappeared; and
after seven days, the ocean 'began to overflow the
' coasts, and the earth to be flooded by constant
' showers, when *Satyavrata*, meditating on the
' Deity, saw a large vessel moving on the waters:
' he entered it, having in all respects conformed to
' the instructions of *Vishnu*; who, in the form of a
' vast fish, suffered the vessel to be tied with a great
' sea-serpent, as with a cable, to his measureless
' horn. When the deluge had ceased, *Vishnu* slew
' the demon, and recovered the *Vedas*, instructed
' *Satyavrata* in divine knowledge, and appointed
' him the seventh *Menu*, by the name of *Vaivas-
' wata*.' Let us compare the two *Indian* accounts
of the *Creation* and the *Deluge* with those delivered
by *Moses*. It is not made a question in this tract,
whether the first chapters of *Genesis* are to be under-
stood in a literal, or merely in an allegorical sense;
the only points before us are, Whether the creation
described by the *first Menu*, which the *Brahmans*
call that of the *Lotos*, be not the same with that re-
corded in our Scripture? and whether the story of

the *ſeventh Menu* be not one and the ſame with that of *Noah?* I propoſe the queſtions, but affirm nothing; leaving others to ſettle their opinions, whether *Adam* be derived from *adim*, which in *Sanſcrit* means the *firſt?* or *Menu* from *Nuh*, the true name of the patriarch? whether the *ſacrifice*, at which *God* is believed to have deſcended, alludes to the offering of *Abel?* and, on the whole, whether the two *Menus* can mean any other perſons than the great progenitor, and the reſtorer of our ſpecies?

On a ſuppoſition that *Vaivaſwata*, or *ſun-born*, was the *Noah* of Scripture, let us proceed to the *Indian* account of his poſterity, which I extract from the *Puranart'haprecaſa*, or *The Puranis Explained:* a work lately compoſed in *Sanſcrit* by *Radhacanta Sarman*, a *Pandit* of extenſive learning and great fame among the *Hindus* of this province. Before we examine the genealogies of kings, which he has collected from the *Puranis*, it will be neceſſary to give a general idea of the *avataras*, or *deſcents*, of the Deity. The *Hindus* believe innumerable ſuch deſcents or ſpecial interpoſitions of Providence in the affairs of mankind, but they reckon *ten* principal *avataras* in the current period of four ages; and all of them are deſcribed in order, as they are ſuppoſed to occur, in the following Ode of *Jayadeva*, the great lyric poet of *India*.

1. " Thou recovereſt the *Veda* in the water of the ocean of deſtruction, *placing it* joyfully in the boſom of an ark, fabricated *by thee, O Ceſava*, aſſuming the body of a *fiſh*. Be victorious, *O Heri*, lord of the univerſe!

2. " The earth ſtands firm on thy immenſely broad back, which grows larger from the callus,

occaſioned by bearing that vaſt burden, *O Ceſava*, aſſuming the body of a *tortoiſe*. Be victorious, *O Heri*, lord of the univerſe!

3. " The earth, placed on the point of thy tuſk, remains fixed like the figure of a black antelope on the moon, *O Ceſava*, aſſuming the form of a *boar*. Be victorious, *O Heri*, lord of the univerſe!

4. " The claw with a ſtupendous point, on the exquiſite lotos of thy lion's paw, is the black bee that ſtung the body of the embowelled *Hiranyacaſipu*, *O Ceſava*, aſſuming the form of a *man-lion*. Be victorious, *O Heri*, lord of the univerſe!

5. " By thy power thou beguileſt *Bali*, O thou miraculous dwarf, thou purifier of men with the water (of *Ganga*) ſpringing from thy feet, *O Ceſava*, aſſuming the form of a *dwarf*. Be victorious, *O Heri*, lord of the univerſe!

6. " Thou batheſt in pure water, conſiſting of the blood of *Cſhatriyas*, the world whoſe offences are removed, and who are relieved from the pain of other births, *O Ceſava*, aſſuming the form of *Paraſu-Rama*. Be victorious, *O Heri*, lord of the univerſe!

7. " With eaſe to thyſelf, with delight to the Genii of the eight regions, thou ſcattereſt on all ſides in the plain of combat the demon with ten heads, *O Ceſava*, aſſuming the form of *Rama-Chandra*. Be victorious, *O Heri*, lord of the univerſe!

8. " Thou weareſt on thy bright body a mantle

ſhining like a blue cloud, or like the water of *Yamuna* tripping towards thee through fear of thy furrowing *ploughſhare*, O *Ceſava*, aſſuming the form of *Balla Rama*. Be victorious, O *Heri*, lord of the universe!

9. " Thou blameſt (Oh, wonderful!) the whole *Veda*, when thou ſeeſt, O kind-hearted, the ſlaughter of cattle preſcribed for ſacrifice, O *Ceſava*, aſſuming the body of *Buddha*. Be victorious, O *Heri*, lord of the univerſe!

10. " For the deſtruction of all the impure thou draweſt thy cimeter like a blazing comet (how tremendous!) O *Ceſava*, aſſuming the body of *Calci*. Be victorious, O *Heri*, lord of the univerſe!"

Theſe ten *Avataras* are by ſome arranged according to the thouſands of divine years in each of the four ages, or in an arithmetical proportion from four to one; and, if ſuch an arrangement were univerſally received, we ſhould be able to aſcertain a very material point in the *Hindu* chronology; I mean the birth of *Buddha*, concerning which the different *Pandits*, whom I have conſulted, and the ſame *Pandits* at different times, have expreſſed a ſtrange diverſity of opinion. They all agree that *Calci* is yet to come, and that *Buddha* was the laſt conſiderable incarnation of the Deity; but the aſtronomers at *Varanes* place him in the *third* age, and *Radhacant* inſiſts that he appeared after the *thouſandth* year of the *fourth*. The learned and accurate author of the *Dabiſtan*, whoſe information concerning the *Hindus* is wonderfully correct, mentions an opinion of the *Pandits*, with whom he had converſed, that *Buddha* began his career *ten* years before the cloſe of the third age; and *Goverdhana* of *Caſhmir*, who had once informed me that *Criſhna* deſcended *two centuries* before *Buddha*,

aſſured me lately that the *Caſhmirians* admitted an interval of *twenty-four* years (others allow only *twelve*) between theſe two divine perſons. The beſt authority, after all, is the *Bhagawat* itſelf, in the firſt chapter of which it is expreſsly declared, that "*Bud-*" *dha*, the ſon of *Jina*, would appear at *Cicata* for " the purpoſe of confounding the demons, *juſt at* " *the beginning* of the *Caliyug*." I have long been convinced, that, on theſe ſubjects, we can only reaſon ſatisfactorily from *written* evidence, and that our forenſick rule muſt be invariably applied *to take the declarations of the* Brahmans *moſt ſtrongly againſt themſelves*; that is, *againſt their pretenſions to antiquity*; ſo that, on the whole, we may ſafely place *Buddha juſt at the beginning* of the *preſent* age: but what is the *beginning* of it? When this queſtion was propoſed to *Radhacant*, he anſwered, " Of a period com-" priſing more than four hundred thouſand years, " the firſt two or three thouſand may reaſonably be " called *the beginning*." On my demanding *written* evidence, he produced a book of ſome authority, compoſed by a learned *Goſwami*, and entitled *Bhagawatamarita*, or the *Nectar* of the *Bhagawat*, on which it is a metrical comment; and the couplet which he read from it deſerves to be cited. After the juſt mentioned account of *Buddha* in the text, the commentator ſays,

Aſau vyaktah calerabdaſahaſradwitaye gate,
Murtih patalaverna'ſya dwibhuja chicurojj'hita.

' He *became* viſible, the-thouſand-and-ſecond-year-of-' the Cali-*age being* paſt; his body of-a-colour-be-' tween-white and-ruddy, with-two-arms, without-' hair *on his head*.'

Cicata, named in the text as the birth-place of

Buddha, the *Goſwami* ſuppoſes to have been *Dhermaranya*, a wood near *Gaya*, where a coloſſal image of that ancient deity ſtill remains. It ſeemed to me of black ſtone; but, as I ſaw it by torch-light, I cannot be poſitive as to its colour, which may indeed have been changed by time.

The *Brahmans* univerſally ſpeak of the *Bauddhas* with all the malignity of an intolerant ſpirit; yet the moſt orthodox among them conſider *Buddha* himſelf as an incarnation of *Viſhnu*. This is a contradiction hard to be reconciled, unleſs we cut the knot, inſtead of untying it, by ſuppoſing with *Giorgi*, that there were *two Buddhas*, the younger of whom eſtabliſhed the new religion, which gave ſo great offence in *India*, and was introduced into *China* in the firſt century of our æra. The *Caſhmirian* before mentioned aſſerted this fact, without being led to it by any queſtion that implied it; and we may have reaſon to ſuppoſe that *Buddha* is in truth only a general word for a *Philoſopher*. The author of a celebrated *Sanſcrit* Dictionary, entitled from his name *Amaracoſha*, who was himſelf a *Bauddha*, and flouriſhed in the firſt century before *Chriſt*, begins his vocabulary with nine words that ſignify *heaven*, and proceeds to thoſe which mean *a deity in general*; after which come different *claſſes* of *Gods*, *Demigods*, and *Demons*, all by *generic* names; and they are followed by two very remarkable heads; firſt (not the *general names* of *Buddha*, but) the names of a *Buddha-in-general*, of which he gives us eighteen, ſuch as *Muni*, *Saſtri*, *Munindra*, *Vinayaca*, *Samantabhadra Dhermaraja*, *Sugata*, and the like; moſt of them ſignificative of *excellence*, *wiſdom*, *virtue*, and *ſanctity*; ſecondly, the names of *a particular-Buddha-Muni*-who-deſcended-in-the-family-of-*Sacya* (theſe are the very words of the original) and his titles are, *Sacyamuni*, *Sacyaſinha*,

Servart'hasiddha, *Saudhodani*, *Gautama*, *Arcabandhu*, or *Kinsman of the Sun*, and *Mayadevisuta*, or *Child of Maya*. Thence the author passes to the different epithets of particular *Hindu* deities. When I pointed out this curious passage to *Radhacant*, he contended that the first eighteen names were *general* epithets, and the following seven *proper names*, or *patronymics*, of one and the same person; but *Ramalochan*, my own teacher, who though not a *Brahman* is an excellent scholar and a very sensible unprejudiced man, assured me that *Buddha* was a *generic* word, like *Deva*, and that the learned author, having exhibited the names of a *Devata* in general, proceeded to those of a *Buddha* in general, before he came to particulars: he added, that *Buddha* might mean a *Sage* or *Philosopher*, though *Budha* was the word commonly used for a mere *wise man* without supernatural powers. It seems highly probable, on the whole, that the *Buddha* whom *Jayadeva* celebrates in his Hymn, was the *Sacyasinha*, or *Lion of Sacya*, who, though he forbade the sacrifices of cattle, which the *Vedas* enjoin, was believed to be *Vishnu* himself in a human form, and that another *Buddha*, one perhaps of his followers in a later age, assuming his name and character, attempted to overset the whole system of the *Brahmans*, and was the cause of that persecution, from which the *Bauddhas* are known to have fled into very distant regions. May we not reconcile the singular difference of opinion among the *Hindus* as to the time of *Buddha*'s appearance, by supposing that they have confounded the *two Buddhas*, the first of whom was born a few years before the close of the last age, and the second, when above a thousand years of the present age had elapsed? We know from better authorities, and with as much certainty as can justly be expected on so doubtful a subject, the real time, compared with our own æra, when the ancient *Buddha* began to

diſtinguiſh himſelf; and it is for this reaſon principally that I have dwelt with minute anxiety on the ſubject of the laſt *Avatar*.

The *Brahmans*, who aſſiſted *Abulfazi* in his curious but ſuperficial account of his maſter's empire, informed him, if the figures in the *Ayini Acbari* be correctly written, that a period of 2962 years had elapſed from the birth of *Buddha* to the 40th year of *Acbar*'s reign; which computation will place his birth in the 1366th year before that of our Saviour; but, when the *Chineſe* government admitted a new religion from India, in the firſt century of our æra, they made particular enquiries concerning the age of the old *Indian Buddha*, whoſe birth, according to *Couplet*, they place in the 41ſt year of their 28th cycle, or 1036 years before *Chriſt*; and they call him, ſays he, *Foe*, the ſon of *Moye* or *Maya*; but M. *De Guignes*, on the authority of four *Chineſe* hiſtorians, aſſerts, that *Fo* was born about the year before *Chriſt* 1027, in the kingdom of *Caſhmir*. *Giorgi*, or rather *Caſſiano*, from whoſe papers his work was compiled, aſſures us, that, by the calculation of the *Tibetians*, he appeared only 959 years before the *Chriſtian* epoch; and M. *Bailly*, with ſome heſitation, places him 1031 before it, but inclines to think him far more ancient, confounding him, as I have done in a former tract, with the firſt *Buddha*, or *Mercury*, whom the *Goths* called *Woden*, and of whom I ſhall preſently take particular notice. Now, whether we aſſume the medium of the four laſt-mentioned dates, or implicitly rely on the authorities quoted by *De Guignes*, we may conclude, that *Buddha* was firſt diſtinguiſhed in this country *about a thouſand* years before the beginning of our æra; and whoever, in ſo early an age, expects a certain epoch unqualified with *about* or *nearly*, will be greatly diſappointed. Hence it is clear, that, whe-

ther the fourth age of the *Hindus* began about *one* thousand years before *Chrift*, according to *Goverdhan*'s account of *Buddha*'s birth, or *two* thoufand, according to that of *Radhacant*, the common opinion that 4888 years of it are now elapfed, is erroneous; and here for the prefent we leave *Buddha*, with an intention of returning to him in due time; obferving only, that if the learned *Indians* differ fo widely in their accounts of the age when their ninth *Avatar* appeared in their country, we may be affured that they have no certain chronology before him, and may fufpect the certainty of all the relations concerning even *his* appearance.

The received chronology of the *Hindus* begins with an abfurdity fo monftrous, as to overthrow the whole fyftem; for, having eftablifhed their period of *feventy-one divine ages*, as the reign of each *Menu*, yet thinking it incongruous to place a holy perfonage in times of *impurity*, they infift that the *Menu* reigns only in every *golden* age, and difappears in the *three human ages* that follow it, continuing to dive and emerge like a water-fowl, till the clofe of his *Manwantara*. The learned author of the *Puranart'hapracafa*, which I will now follow ftep by ftep, mentioned this ridiculous opinion with a ferious face; but, as he has not inferted it in his work, we may take his account of the feventh *Menu* according to its obvious and rational meaning; and fuppofe that *Vaifvafwata*, the fon of *Surya*, the fon of *Cafyapa*, or *Uranus*, the fon of *Marichi*, or *Light*: the fon of *Brahma*, which is clearly an allegorical pedigree, reigned in the laft golden age, or, according to the *Hindus*, three million eight hundred and ninety-two thoufand eight hundred and eighty-eight years ago. But they contend that he actually reigned on earth *one million feven hundred and twenty-eight thoufand* years of mortals, or

four thousand eight hundred years of the Gods; and this opinion is another monster so repugnant to the course of nature and to human reason, that it must be rejected as wholly fabulous, and taken as a proof, that the *Indians* know nothing of their *sun-born Menu* but his name and the principal event of his life; I mean the *universal deluge*, of which the *three* first *Avatars* are merely allegorical representations, with a mixture, especially in the *second*, of astronomical mythology.

From this *Menu* the whole race of men is believed to have descended; for the seven *Rishis*, who were preserved with him in the ark, are not mentioned as fathers of human families; but, since his daughter *Ila* was married, as the *Indians* tell us, to the first *Buddha*, or *Mercury*, the son of *Chandra*, or the *Moon*, a male-deity, whose father was *Atri*, son of *Brahma* (where again we meet with an allegory purely astronomical or poetical) his posterity are divided into two great branches, called the *Children of the Sun*, from his own supposed father; and the *Children of the Moon*, from the parent of his daughter's husband. The lineal male descendants in both these families, are supposed to have reigned in the cities of *Ayodhya*, or *Audh*, and *Pratisht'hana*, or *Vitora*, respectively till the *thousandth year of the present age*; and the names of all the princes in both lines having been diligently collected by *Radhacant* from several *Puranas*, I exhibit them in two columns, arranged by myself with great attention.

SECOND AGE.

CHILDREN OF THE

	SUN.	MOON.	
	Icſhwacu,	*Budha*,	
	Vicucſhi,	*Pururavas*,	
	Cucutſt'ha,	Ayuſh,	
	Aneas,	Nabuſha,	
5.	*Prit'hu*,	*Yayati*,	5.
	Viſwagandhi,	*Puru*,	
	Chandra,	Janamejaya,	
	Yuvanaſwa,	Prachinwat,	
	Srava,	Pravira,	
10.	Vrihadaſwa,	Menaſyu,	10.
	Dhundhumara,	Charupada,	
	Drid'haſwa,	Sudyu,	
	Heryaſwa,	Bahugava,	
	Nicumbha,	Sanyati.	
15.	Criſaſwa,	Ahanyati,	15.
	Senajit,	Raudraſwa,	
	Yuvanaſwa,	Riteyuſh,	
	Mandhatri,	Rantinava,	
	Purucutſa,	Sumati,	
20.	Traſadaſyu,	Aiti,	20.
	Anaranya,	*Duſhmanta*,	
	Heryaſwa,	*Bharata*,	
	Praruna,	(Vitat'ha,	

CHILDREN OF THE

	SUN.	MOON.	
	Trivindhana,	Manyu,	
25.	Satyavrata,	Vrihatcshetra,	25.
	Trisancu,	Hastin,	
	Harischandra,	Ajamid'ha,	
	Rohita,	Riclha,	
	Harita,	Samwarana,	
30.	Champa,	*Curu*,	
	Sudeva,	*Jahnu*,	
	Vijaya,	Surat'ha,	
	Bharuca,	Vidurat'ha,	
	Vrica,	Sarvabhauma,	
35.	Bahuca,	Jayatsena,	35.
	Sagara,	Radhica,	
	Asamanjas,	Ayutayush,	
	Ansumat,	Acrodhana,	
	Bhagirat'ha,	Devatit'hi,	
40.	Sruta,	Richa,	40.
	Nabha,	*Dilipa*,	
	Sindhudwipa,	Pratipa,	
	Ayutayush,	Santanu,	
	Ritaperna,	*Vichitravirya*,	
45.	Saudasa,	Pandu,	45.
	Asmaca,	*Yudhisht'hir*)	
	Mulaca,		
	Dasarat'ha,		

CHILDREN OF THE

	SUN.	MOON.
	Aidabidi,	
50.	Viſwaſaha,	
	C'hatwanga,	
	Dirghabahu,	
	Raghu,	
	Aja,	
55.	*Daſarat'ha,*	
	Rama.	

It is agreed among all the *Pandits*, that *Rama*, their *ſeventh* incarnate Divinity, appeared as king of *Ayodhya* in the *interval* between the *ſilver* and the *brazen* ages; and, if we ſuppoſe him to have began his reign at the very beginning of that interval, ſtill *three thouſand three hundred* years of the Gods, or *a million one hundred and eighty-eight thouſand* lunar years of mortals, will remain in the *ſilver* age, during which the *fifty-five* princes between *Vaivaſwata* and *Rama* muſt have governed the world; but, reckoning *thirty* years for a generation, which is rather too much for a long ſucceſſion of *eldeſt* ſons, as they are ſaid to have been, we cannot, by the courſe of nature, extend the *ſecond* age of the *Hindus* beyond *ſixteen hundred and fifty* ſolar years. If we ſuppoſe them not to have been eldeſt ſons, and even to have lived longer than modern princes in a diſſolute age, we ſhall find only a period of *two thouſand* years; and, if we remove the difficulty by admitting miracles, we muſt ceaſe to reaſon, and may as well believe at once whatever the *Brahmans* chuſe to tell us.

In the *lunar* pedigree we meet with another abſurdity equally fatal to the credit of the *Hindu* ſyſtem. As far as the twenty-ſecond degree of deſcent from *Vaivaſwata*, the ſynchroniſm of the two families appears tolerably regular, except that the Children of the Moon were not all *eldeſt* ſons; for king *Yayati* appointed the youngeſt of his five ſons to ſucceed him in *India*, and allotted inferior kingdoms to the other four, who had offended him; part of the *dacſhin*, or the *ſouth*, to *Yadu*, the anceſtor of *Criſhna*; the north to *Anu*, the eaſt to *Druhya*, and the weſt to *Turvaſu*, from whom the *Pandits* believe, or pretend to believe, in compliment to our nation, that we are deſcended. But of the ſubſequent degrees in the lunar line they know ſo little, that, unable to ſupply a conſiderable interval between *Bharat* and *Vitat'ha*, whom they call ſon and ſucceſſor, and are under a neceſſity of aſſerting, that the great anceſtor of *Yudhiſht'hir* actually reigned *ſeven-and-twenty thouſand years*: a fable of the ſame claſs with that of his wonderful birth, which is the ſubject of a beautiful *Indian* drama. Now, if we ſuppoſe his life to have laſted no longer than that of other mortals, and admit *Vitat'ha* and the reſt to have been his regular ſucceſſors, we ſhall fall into another abſurdity; for then, if the generations in both lines were nearly equal, as they would naturally have been, we ſhall find *Yudhiſht'hir*, who reigned confeſſedly at the cloſe of the *brazen* age, nine generations older than *Rama*, before whoſe birth the *ſilver* age is allowed to have ended. After the name of *Bharat*, therefore, I have ſet an aſteriſk, to denote a conſiderable chaſm in the *Indian* hiſtory, and have inſerted between brackets, as out of their places, his *twenty-four* ſucceſſors, who reigned, if at all, in the following age, immediately before the war of the *Mahabharat*. The fourth *Avatar*, which is placed in the interval between the *firſt* and *ſecond* ages, and the

fifth which ſoon followed it, appear to be moral fables, grounded on hiſtorical facts. The *fourth* was the puniſhment of an impious monarch, by the Deity himſelf *burſting from a marble column*, in the ſhape of a *lion*; and the *fifth* was the humiliation of an arrogant prince, by ſo contemptible an agent as a mendicant *dwarf*. After theſe, and immediately before *Buddha*, come three great warriors, all named *Rama*; but it may juſtly be made a queſtion, whether they are not three repreſentations of one perſon, or three different ways of relating the ſame hiſtory. The firſt and ſecond *Ramas* are ſaid to have been contemporary; but whether all or any of them mean *Rama*, the ſon of *Cuſh*, I leave others to determine. The mother of the ſecond *Rama* was named *Cauſhalya*, which is a derivative of *Cuſhala*, and, though his father be diſtinguiſhed by the title or epithet of *Daſarat'ha*, ſignifying that *his war-chariot bore him to all quarters of the world*; yet the name of *Cuſh*, as the *Caſhmirians* pronounce it, is preſerved entire in that of his ſon and ſucceſſor, and ſhadowed in that of his anceſtor *Vicucſhi*; nor can a juſt objection be made to this opinion from the naſal *Arabian* vowel in the *Ramah*, mentioned by *Moſes*, ſince the very word *Arab* begins with the ſame letter, which the *Greeks* and *Indians* could not pronounce; and they were obliged, therefore, to expreſs it by the vowel which moſt reſembled it. On this queſtion, however, I aſſert nothing; nor on another, which might be propoſed: "Whether the "*fourth* and *fifth Avatars* be not allegorical ſtories "of the two preſumptuous monarchs, *Nimrod* and "*Belus*?" The hypotheſis, that *government* was firſt eſtabliſhed, *laws* enacted, and *agriculture* encouraged in *India* by *Rama* about *three thouſand eight hundred* years ago, agrees with the received account of *Noah*'s death, and the previous ſettlement of his immediate deſcendants.

THIRD AGE.

CHILDREN OF THE

	SUN.	MOON.	
	Cuſha,		
	Atit'hi,		
	Niſhadha,		
	Nabhas,		
5	Pundarica,		
	Cſhemadhanwas,	Vitat'ha,	
	Devanica,	Manyu,	
	Ahinagu,	Vrihatcſhetra,	
	Paripatra,	Haſtin,	
10.	Ranach'hala,	Ajamid'ha,	5.
	Vajranabha,	Ricſha,	
	Arca,	Samwarana,	
	Sugana,	*Curu*,	
	Vidhriti,	*Jahnu*,	
15.	Hiranyanabha,	Surat'ha,	
	Puſhya,	Vidurat'ha,	
	Dhruvaſandhi,	Sarvabhauma,	
	Suderſana,	Jayatſena,	
	Agniverna,	Radhica,	
20.	Sighra,	Ayutayuſh,	15.
	Maru, ſuppoſed to be ſtill alive,	Acrodhana,	
	Praſuſruta,	Devatit'hi,	
	Sandhi,	Ricſha,	

CHILDREN OF THE

	SUN.	MOON.	
	Amerſana,	Dilipa,	
25.	Mahaſwat,	Pratipa,	20.
	Viſwabhahu,	Santanu,	
	Praſenajit,	Vichitravirya,	
	Tacſhaca,	Pandu,	
	Vrihadbala,	*Yudhiſht'hira*,	
30.	Vrihadrana,	*Paricſhit*,	25.
	Y. B. C. 3100.		

Here we have only *nine*-and-*twenty* princes of the ſolar line between *Rama* and *Vrihadrana* excluſively; and their reigns, during the whole *brazen* age, are ſuppoſed to have laſted near *eight hundred* and *ſixty-four thouſand* years: a ſuppoſition evidently againſt nature, the uniform courſe of which allows only a period of *eight hundred* and *ſeventy*, or, at the very utmoſt, of *a thouſand* years, for *twenty-nine* generations. *Paricſhit*, the great nephew and ſucceſſor of *Yudhiſht'hir*, who had recovered the throne from *Duryodhan*, is allowed without controverſy to have reigned in the interval between the *brazen* and *earthen* ages, and to have died at the ſetting in of the *Caliyug*; ſo that, if the *Pandits* of *Caſhmir* and *Varanes* have made a right calculation of *Buddha*'s appearance, the preſent, or *fourth*, age muſt have begun about *a thouſand* years before the birth of *Chriſt*, and conſequently the reign of *Icſhwacu* could not have been earlier than *four thouſand* years before that great epoch; and even that date will, perhaps, appear, when it ſhall be ſtrictly examined, to be near *two thouſand* years earlier than the truth. I cannot leave the third *Indian* age, in which the virtues and vices of mankind are ſaid to have been equal, with-

out obſerving, that even the cloſe of it is manifeſtly fabulous and poetical, with hardly more *appearance* of hiſtorical truth than the tale of *Troy*, or of the *Argonauts*; for *Yudhiſht'hir*, it ſeems, was the ſon of *Dherma*, the *Genius of Juſtice*; *Bhima* of *Pavan*, or the *God of Wind*; *Arjun* of *Indra*, or the *Firmament*; *Nacul* and *Sahadeva*, of the two *Cumars*, the *Caſtor* and *Pollux* of *India*; and *Bhiſhma*, their reputed great uncle, was the child of *Ganga*, or the *Ganges*, by *Santanu*, whoſe brother *Devapi* is ſuppoſed to be ſtill alive in the city of *Calapa*; all which fictions may be charming embelliſhments of an heroic poem, but are juſt as abſurd in civil hiſtory as the deſcent of the two royal families from the Sun and the Moon.

FOURTH AGE.

CHILDREN OF THE

	SUN.	MOON.	
	Urucriya,	*Janamejaya*,	
	Vatſavriddha,	*Satanica*,	
	Prativyoma,	Sahaſranica,	
	Bhanu,	Aſwamedhaja,	
5.	Devaca,	Aſimacriſhna,	5.
	Sahadeva,	Nemichacra,	
	Vira,	Upta,	
	Vrihadaſwa,	Chitrarat'ha,	
	Bhanumat,	Suchirat'ha,	
10.	Praticaſwa,	Dhritimat,	10.
	Supratica,	Suſhena,	

CHILDREN OF THE

	SUN.	MOON.	
	Marudeva,	Sunit'ha,	
	Sunacshatra,	Nrichacshuh,	
	Pushcara,	Suc'hinala,	
15.	Antaricsha,	Pariplava,	15.
	Sutapas,	Sunaya,	
	Amitrajit,	Medhavin,	
	Vrihadraja,	Nripanjaya,	
	Barhi,	Derva,	
20.	Critanjaya,	Timi,	20.
	Rananjaya,	Vrihadrat'ha,	
	Sanjaya,	Sudasa;	
	Slocya,	Satanica,	
	Suddhoda,	Durmadana,	
25.	Langalada,	Rahinara,	25.
	Prasenajit,	Dandapani,	
	Cshudraca,	Nimi,	
	Sumitra,	Cshemaca,	
	Y.B.C. 2100.		

In both families, we see, *thirty* generations are reckoned from *Yudhisht'hir*, and from *Vrihadbala* his contemporary (who was killed in the war of *Bharat* by *Abhimanyu*, son of *Arjun* and father of *Paricshit*) to the time when the *solar* and *lunar* dynasties are believed to have become extinct in the present divine age; and for these generations the *Hindus* allot a period of *one thousand* years only, or a *hundred* years for *three* generations; which calculation, though pro-

bably too large, is yet moderate enough, compared with their abſurd accounts of the preceding ages; but they reckon exactly the ſame number of years for *twenty* generations only in the family of *Jaraſandha*, whoſe ſon was contemporary with *Yudhiſht'hir*, and founded a new dynaſty of princes in *Magadha*, or *Bahar*; and this exact coincidence of the times, in which the three races are ſuppoſed to have been extinct, has the appearance of an artificial chronology, formed rather from imagination than from hiſtorical evidence, eſpecially as twenty kings, in an age comparatively modern, could not have reigned a thouſand years. I, nevertheleſs, exhibit the liſt of them as a curioſity, but am far from being convinced that all of them ever exiſted; that, if they did exiſt, they could not have reigned more than *ſeven hundred* years, I am fully perſuaded by the courſe of nature and the concurrent opinion of mankind.

Kings of Magadha.

	Sahadeva,	Suchi,	
	Marjari,	Cſhema,	
	Srutasravas,	Suvrata,	
	Ayutayuſh,	Dhermaſutra,	
5.	Niramitra,	Srama,	15.
	Sunacſhatra,	Drid'haſena,	
	Vrihetſena,	Sumati,	
	Carmajit,	Subala,	
	Srutanjaya,	Sunita,	
10.	Vipra,	Satyajit.	20.

Puranjaya, ſon of the twentieth king, was put to death by his miniſter, *Sunaca*, who placed his own ſon *Pradyota* on the throne of his maſter; and this

revolution constitutes an epoch of the highest importance in our present enquiry; first, because it happened according to the *Bhagawatamrita*, two years exactly before *Buddha*'s appearance in the same kingdom; next, because it is believed by the *Hindus* to have taken place *three thousand eight hundred* and *eighty-eight* years ago, or *two thousand one hundred* years before *Christ*; and lastly, because a regular chronology, according to the number of years in each dynasty, has been established from the accession of *Pradyota* to the subversion of the genuine *Hindu*-government; and that chronology I will now lay before you, after observing only, that *Radhacant* himself says nothing of *Buddha* in this part of his work, though he particularly mentions the two preceding *Avataras* in their proper places.

Kings of Magadha.

		Y. B. C.
Pradyota,		2100
Palaca,		
Visac'hayupa,		
Rajaca,		
Nandiverdhana,	5 reigns = 138 years.	
Sisunaga,		
Cacaverna,		1962
Cshemadherman,		
Cshetrajnya.		
Vidhisara	5.	
Ajatasatru,		
Darbhaca.		

Kings of Magadha.

		Y. B. C.
Ajaya		
Nandiverdhana		
Mahanandi,	10 *r.* = 360 *y.*	
Nanda,		1602

This prince, of whom frequent mention is made in the *Sanſcrit* books, is ſaid to have been murdered, after a reign of *a hundred years*, by a very learned and ingenious, but paſſionate and vindictive, *Brahman*, whoſe name was *Chanacya*, and who raiſed to the throne a man of the *Maurya* race, named *Chandragupta*. By the death of *Nanda*, and his ſons, the *Cſhatriya* family of *Pradyota* became extinct.

Maurya Kings.

		Y. B. C.
Chandragupta,		1502
Variſara,		
Aſocaverdhana,		
Suyaſas,		
Deſarat'ha,	5.	
Sangata,		
Saliſuca,		
Somaſarman,		
Satadhanwas,		
Vrihadrat'ha,	10 *r.* = 137 *y.*	

On the death of the tenth *Maurya* king, his place was assumed by his commander in chief, *Pushpamitra*, of the *Sunga* nation or family.

Sunga Kings.

		Y. B. C.
Pushpamitra,		1365
Agnimitra,		
Sujyesht'ha,		
Vasumitra,		
Abhadraca.	5.	
Pulinda,		
Ghosha,		
Vajramitra,		
Bhagavata,		
Devabhuti,	10 *r.* = 112 *y.*	

The last prince was killed by his minister *Vasudeva*, of the *Canna* race, who usurped the throne of *Magadha*.

Canna Kings.

		Y. B. C.
Vasudeva,		
Bhumitra,		
Narayana,		
Susarman,	4 *r.* = 345 *y.*	

A *Sudra*, of the *Andhra* family, having murdered his master *Susarman*, and seized the government, founded a new dynasty of

Andhra Kings.

		Y. B C.
Balin,		908
Crishna,		
Srisantacarna,		
Paurnamasa,		
Lambodara,	5.	
Vivilaca,		
Meghaswata,		
Vatamana,		
Talaca,		
Sivaswati,	10.	
Purishhabheru,		
Sunandana,		
Chacoraca,		
Bataca,		
Gomatin	15.	
Purimat,		
Medasiras,		
Sirascand'ha,		
Yajnyasri,		
Vijaya	20.	
Chandrabija,	21 *r.* = 456 *y.*	

After the death of *Chandrabija*, which happened, according to the *Hindus*, 396 years before *Vicramaditya*, or 452 B. C. we hear no more of *Magadha* as an independent kingdom; but *Radhacant* has exhibited the names of *ſeven* dynaſties, in which *ſeventy-ſix* princes are ſaid to have reigned *one thouſand three hundred and ninety-nine years* in *Avabhriti*, a town of the *Dacſhin*, or *South*, which we commonly call *Decan*. The names of the ſeven dynaſties, or of the families who eſtabliſhed them, are *Abhira*, *Gardabhin*, *Canca*, *Yavana*, *Turuſhcara*, *Bhurunda*, *Maula*; of which the *Yavanas* are by ſome, not generally, ſuppoſed to have been *Ionians* or *Greeks*, but the *Turuſhcaras* and *Maulas* are univerſally believed to have been *Turcs* and *Moguls*; yet *Radhacant* adds, "when "the *Maula* race was extinct, five princes, named *Bhunanda Bangira*, *Siſunandi*, *Yaſonandi*, and *Praviraca*, reigned *an hundred and ſix years* (or till the year "1053 in the city of *Cilacila*," which he tells me, he underſtands to be in the country of the *Maharaſhtras*, or *Mahrattas*; and here ends his *Indian* chronology; for "after *Praviraca*," ſays he, "this empire "was divided among *Mlech'has*, or Infidels." This account of the *ſeven modern dynaſties* appears very doubtful in itſelf, and has no relation to our preſent inquiry; for their dominion ſeems confined to the *Decan*, without extending to *Magadha*; nor have we any reaſon to believe that a race of *Grecian* princes ever eſtabliſhed a kingdom in either of thoſe countries. As to the *Moguls*, their dynaſty ſtill ſubſiſts, at leaſt nominally, unleſs that of *Chengiz* be meant; and his ſucceſſors could not have reigned in any part of *India* for the period of *three hundred* years, which is aſſigned to the *Maulas*; nor is it probable that the word *Turc*, which an *Indian* could have eaſily pronounced and clearly expreſſed in the *Nagari* letters, ſhould have been corrupted into *Turuſhcara*. On the whole, we may ſafely cloſe the moſt authentic

ſyſtem of *Hindu* Chronology that I have yet been able to procure, with the death of *Chandrabija*. Should any farther information be attainable, we ſhall, perhaps, in due time attain it either from books or inſcriptions in the *Sanſcrit* language; but from the materials with which we are at preſent ſupplied, we may eſtabliſh as indubitable the two following propoſitions: That the *three firſt* ages of the *Hindus* are chiefly *mythological*, whether their mythology was founded on the dark enigmas of their aſtronomers, or on the heroic fictions of their poets; and that the *fourth*, or *hiſtorical* age, cannot be carried farther back than about two thouſand years before *Chriſt*. Even in the hiſtory of the preſent age, the generations of men and the reigns of kings are extended beyond the courſe of nature, and beyond the average reſulting from the accounts of the *Brahmans* themſelves; for they aſſign to *an hundred and forty-two* modern reigns a period of *three thouſand one hundred and fifty-three* years, or about *twenty-two* years to a reign one with another; yet they repreſent only four *Canna* princes on the throne of *Magadha* for a period of *three hundred* and *forty-five* years; now it is even more improbable that four ſucceſſive kings ſhould have reigned *eighty-ſix years and three months* each, than that *Nanda* ſhould have been king a *hundred* years, and murdered at laſt. Neither account can be credited; but, that we may allow the higheſt probable antiquity to the *Hindu* government, let us grant that *three generations* of men were equal on an average to *an hundred* years, and that *Indian* princes have reigned, one with another, *two-and-twenty*: then reckoning thirty generations from *Arjun*, the brother of *Yudhiſt'hira*, to the extinction of his race, and taking the *Chineſe* account of *Buddha*'s birth from M. *De Guignes*, as the moſt authentic medium between *Abu'lfazl* and the *Tibetians*, we may arrange the corrected *Hindu* Chronology according to the fol-

lowing table, ſupplying the word *about* or *nearly* (ſince perfect accuracy cannot be obtained, and ought not to be required) before every date.

	Y. B. C.
Abhimanyu, *ſon of Arjun,*	2029
Pradyota,	1029
Buddha,	1027
Nanda,	699
Balin,	149
Vicramaditya,	56
Devapala, king of Gaur,	23

If we take the date of *Buddha*'s appearance from *Abu'lfazl*, we muſt place *Abhimanyu* 2368 years before *Chriſt*, unleſs we calculate from the twenty kings of *Magadha*, and allow *ſeven hundred* years, inſtead of *a thouſand*, between *Arjun* and *Pradyota*, which will bring us again very nearly to the date exhibited in the table; and, perhaps, we can hardly approach nearer to the truth. As to *Raja Nanda*, if he really ſat on the throne a whole century, we muſt bring down the *Andhra* dynaſty to the age of *Vicramaditya*, who with his feudatories had probably obtained ſo much power during the reign of thoſe princes, that they had little more than a nominal ſovereignty, which ended with *Chandrabija* in the *third* or *fourth* century of the *Chriſtian* æra; having, no doubt, been long reduced to inſignificance by the kings of *Gaur*, deſcended from *Gopala*. But, if the author of the *Dabiſtan* be warranted in fixing the birth of *Buddha ten* years before the *Caliyug*, we muſt thus correct the Chronological Table:

		Y. B. C.
Buddha,	—	1027
Paricshit,	—	1017
Pradyota (reckoning 20 *or* 30 generations)		317 or 17
		Y. A. C.
Nanda,	—	13 or 313

This correction would oblige us to place *Vicramaditya* before *Nanda*, to whom, as all the *Pandits* agree, he was long posterior; and, if this be an historical fact, it seems to confirm the *Bhagawatamrita*, which fixes the beginning of the *Culiyug* about *a thousand* years before *Buddha*; besides that *Balin* would then be brought down at least to the sixth, and *Chundrabija* to the tenth century after *Christ*, without leaving room for the subsequent dynasties, if they reigned successively.

Thus have we given a sketch of *Indian* history through the longest period fairly assignable to it, and have traced the foundation of the *Indian* empire above *three thousand eight hundred years* from the present time; but, on a subject in itself so obscure, and so much clouded by the fictions of the *Brahmans*, who, to aggrandize themselves, have designedly raised their antiquity beyond the truth, we must be satisfied with probable conjecture and just reasoning from the best attainable data; nor can we hope for a system of *Indian* Chronology, to which no objection can be made, unless the astronomical books in *Sanscrit* shall clearly ascertain the places of the colures in some precise years of the historical age, not by loose traditions, like that of a coarse observation by

Chiron, who poſſibly never exiſted (for "he lived," ſays *Newton*, "in the *golden* age," which muſt long have preceded the *Argonautic* expedition) but by ſuch evidence as our own aſtronomers and ſcholars ſhall allow to be unexceptionable.

A CHRONOLOGICAL TABLE,

according to one of the Hypotheses intimated in the preceding Tract.

CHRISTIAN AND MUSELMAN.		HINDU.		Years from 1788 of our æra.
Adam,		*Menu* I.	Age I.	5794
Noah,		*Menu* II.		4737
Deluge,	—	—		4138
Nimrod,		*Hiranyacasipu.*	Age II.	4006
Bel,		*Bali,*		3892
Rama,		*Rama.*	Age III.	3187
Noah's death,	—	—		3787
		Pradyota,		2817
		Buddha.	Age IV.	2815
		Nanda,		2487
		Balin,		1937
		Vicramaditya,		1844
		Devapala,		1811
Christ,	—	—		1787
		Narayanpala,		1721
		Saca,		1709
Walid,	—	—		1080
Mahmud,	—	—		786
Chengiz,	—	—		548
Taimur,	—	—		391
Babur,	—	—		276
Nadirshah,	—	—		49

VIII.

ON THE CURE OF THE ELEPHANTIASIS.

BY AT'HAR ALI KHAN OF DEHLI.

INTRODUCTORY NOTE.

AMONG the afflicted maladies which punish the vices and try the virtues of mankind, there are few disorders of which the consequences are more dreadful or the remedy in general more desperate than the *judham* of the *Arabs*, or *khorah* of the *Indians*. It is also called in *Arabia daul'asad*: a name corresponding with the *Leontiasis* of the *Greeks*, and supposed to have been given in allusion to the grim distracted and *lion-like* countenance of the miserable persons who are affected with it. The more common name of the distemper is *Elephantiasis*, or, as *Lucretius* calls it, *Elephas*, because it renders the skin, like that of an *Elephant*, uneven and wrinkled, with many tubercles and furrows; but this complaint must not be confounded with the *daul'fil*, or *swelled legs*, described by the *Arabian* physicians, and very common in this country. It has no fixed name in *English*, though *Hillary*, in his *Observations on the Diseases of Barbadoes*, calls it *the Leprosy of the Joints*, because it principally affects the extremities, which in the last stage of the malady are distorted, and at length drop off; but, since it is in truth a distemper corrupting the whole mass of blood, and therefore considered by *Paul* of *Ægina* as an *universal ulcer*, it requires a more general appellation, and may properly be named the *Black Leprosy*: which term is in fact adopted by M. *Boissieu* de *Sauvages* and *Gorræus*, in contradistinction to the *White*

Leprofy, or the *Beres* of the *Arabs*, and *Leuce* of the *Greeks*.

This difeafe, by whatever name we diftinguifh it, is peculiar to hot climates, and has rarely appeared in *Europe*. The philofophical poet of *Rome* fuppofes it confined to *the Banks of the Nile*; and it has certainly been imported from *Africa* into the *Weft India* iflands by the black flaves, who carried with them their refentment and their revenge; but it has been long known in *Hinduftan*: and the writer of the following Differtation, whofe father was phyfician to *Nadifhah*, and accompanied him from *Perfia* to *Dehli*, affures me that it rages with virulence among the native inhabitants of *Calcutta*. His obfervation, that it is frequently a confequence of the *venereal infection*, would lead us to believe that it might be radically cured by *mercury*; which has, neverthelefs, been found ineffectual, and even hurtful, as *Hillary* reports, in the *Weft Indies*. The juice of *hemlock*, fuggefted by the learned *Michaelis*, and approved by his medical friend *Roederer*, might be very efficacious at the beginning of the diforder, or in the milder forts of it; but, in the cafe of a malignant and inveterate *judham*, we muft either adminifter a remedy of the higheft power, or, agreeably to the defponding opinion of *Celfus*, *leave the patient to his fate*, *inftead of teafing him with fruitlefs medicines*, and fuffer him, in the forcible words of *Aretæus*, *to fink from inextricable flumber into death*. The life of a man is, however, fo dear to him by nature, and in general fo valuable to fociety, that we fhould never defpond while a fpark of it remains; and, whatever apprehenfions may be formed of future danger from the diftant effects of *arfenic*, even though it fhould eradicate a prefent malady, yet, as no fuch inconvenience has arifen from the ufe of it in *India*, and as experience

muſt ever prevail over theory, I cannot help wiſhing that this ancient *Hindu* medicine may be fully tried, under the inſpection of our *European* ſurgeons, whoſe minute accuracy and ſteady attention muſt always give them a claim to ſuperiority over the moſt learned natives; but many of our countrymen have aſſured me, that they by no means entertain a contemptuous opinion of the native medicines, eſpecially in diſeaſes of the ſkin. Should it be thought that the mixture of ſulphur muſt render the poiſon leſs active, it may be adviſeable at firſt to adminiſter orpiment, inſtead of the *cryſtalline arſenic.*

ON THE CURE OF THE ELEPHANTIASIS, AND OTHER DISORDERS OF THE BLOOD.

GOD IS THE ALL-POWERFUL HEALER.

IN the year of the *Messiah* 1783, when the worthy and respectable *Maulavi Mir Muhammed Husain*, who excels in every branch of useful knowledge, accompanied Mr. *Richard Johnson* from *Lac'hnau* to *Calcutta*, he visited the humble writer of this tract, who had long been attached to him with sincere affection; and, in the course of their conversation, 'One of the fruits of my late excursion,' said he, 'is a present for you, which suits your profession, 'and will be generally useful to our species. Conceiving you to be worthy of it, by reason of your assiduity in medical inquires, I have brought you a prescription, the ingredients of which are easily found 'but not easily equalled, as a powerful remedy against 'all corruptions of the blood, the *judham*, and the '*Persian* fire, the remains of which are a source of 'infinite maladies. It is an old secret of the *Hindu* 'physicians, who applied it also to the cure of cold 'and moist distempers; as the palsy, distortions of the 'face, relaxation of the nerves, and similar diseases. 'Its efficacy too has been proved by long experience; 'and this is the method of preparing it:—

'Take of white *arsenic*, fine and fresh, one *tola*; 'of picked black pepper six times as much: let both 'be well beaten at intervals for four days successively 'in an iron mortar, and then reduced to an impalpa-

'ble powder in one of ſtone with a ſtone-peſtle, and
'thus completely levigated, a little water being mixed
'with them. Make pills of them as large as tares
'or ſmall pulſe, and keep them dry in a ſhady
'place *.

'One of thoſe pills muſt be ſwallowed, morning
'and evening, with ſome *betel*-leaf, or, in countries
'where *betel* is not at hand, with cold water. If the
'body be cleanſed from foulneſs and obſtructions by
'gentle cathartics and bleeding before the medicine
'is adminiſtered, the remedy will be ſpeedier.'

The principal ingredient of this medicine is the *arſenic*, which the *Arabs* call *Shuce*; the *Perſians*, *Mergi Muſh*, or *mouſe-bane*; and the *Indians*, *Sanc'hya*: a mineral ſubſtance, ponderous and *cryſtalline*. The *orpiment*, or *yellow* arſenic, is the weaker ſort. It is deadly poiſon, and ſo ſubtil, that, when mice are killed by it, the very ſmell of the dead will deſtroy the living of that ſpecies. After it has been kept about

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* The loweſt weight in general uſe among the *Hindus* is the *reti*, called in *Sanſcrit* either *rettica* or *ractica*, indicating *redneſs*; and *criſhnala*, from *criſhna*, *black*; it is the *red* and *black* ſeed of the *gunja* plant, which is a creeper of the ſame claſs and order at leaſt with *glycyrrhiza*: but I take this from report, having never examined its bloſſoms. One *rattica* is ſaid to be of equal weight with three barley-corns, or four grains of rice in the buſk: and eight *reti*-weights, uſed by jewellers, are equal to ſeven carats. I have weighed a number of the ſeeds in diamond-ſcales, and find the average apothecary's weight of one ſeed to be a grain *and five-ſixteenths*. Now, in the *Hindu* medical books, *ten* of the *rattica*-ſeeds are one *maſhaca*; and *eight maſhacas* make a *tolaca*, or *tola*; but in the law-books of *Bengal*, a *maſhaca* conſiſts of *ſixteen racticas*, and a *tolaca* of *five maſhas*; and, according to ſome authorities, *five retis* only go to one *maſha*, *ſixteen* of which make a *tolaca*. We may obſerve, that the ſilver *reti*-weights, uſed by the goldſmiths at *Banares* are *twice* as heavy as the *ſeeds*; and thence it is that *eight retis* are commonly ſaid to conſtitute one *maſha*; that is, *eight* ſilver weights, or *ſixteen* ſeeds, *eighty* of which ſeeds, or 105 grains, conſtitute the quantity of arſenic in the *Hindu* preſcription.

ſeven years, it loſes much of its force; its colour becomes turbid, and its weight is diminiſhed. This mineral is hot and dry in the fourth degree: it cauſes ſuppuration, diſſolves or unites according to the quantity given, and is very uſeful in cloſing the lips of wounds when the pain is too intenſe to be borne. An unguent made of it with oils of any ſort, is an effectual remedy for ſome cutaneous diſorders; and, mixed with roſe water, it is good for cold tumours, and for the dropſy; but it muſt never be adminiſtered without the greateſt caution; for ſuch is its power, that the ſmalleſt quantity of it in powder, drawn, like *alcohol*, between the eye-laſhes, would in a ſingle day entirely corrode the coats and humours of the eye; and fourteen *retis* of it would in the ſame time deſtroy life. The beſt antidote againſt its effects are the ſcrapings of leather reduced to aſhes. If the quantity of arſenic taken be accurately known, four times as much of thoſe aſhes, mixed with water and drank by the patient, will ſheath and counteract the poiſon.

The writer, conformably to the directions of his learned friend, prepared the medicine; and, in the ſame year, gave it to numbers, who were reduced by the diſeaſes above mentioned to the point of death. *God* is his witneſs that they grew better from day to day, were at laſt completely cured, and are now living (except one or two, who died of other diſorders) to atteſt the truth of this aſſertion. One of his firſt patients was a *Parſi*, named *Menuchehr*, who had come from *Surat* to this city, and had fixed his abode near the writer's houſe: he was ſo cruelly afflicted with a confirmed lues, here called *the Perſian Fire*, that his hands and feet were entirely ulcerated and almoſt corroded, ſo that he became an object of diſguſt and abhorrence. This man conſulted the writer on his caſe, the ſtate of which he diſcloſed without re-

ſerve. Some blood was taken from him on the ſame day, and a cathartic adminiſtered on the next. On the third day he began to take the *arſenic-pills*, and, by the bleſſing of *God*, the virulence of his diſorder abated by degrees, until ſigns of returning health appeared. In a fortnight his recovery was complete, and he was bathed, according to the practice of our phyſicians. He ſeemed to have no virus left in his blood, and none has been ſince perceived by him.

But the power of this medicine has chiefly been tried in the cure of the *Juzam*, as the word is pronounced in *India:* a diſorder infecting the whole maſs of blood, and thence called by ſome, *fiſadi khun*. The former name it derived from an *Arabic* root, ſignifying, in general, *amputation*, *maiming*, *exciſion*, and, particularly, the *truncation* or *eroſion of the fingers*, which happens in the laſt ſtage of the diſeaſe. It is extremely contagious; and, for that reaſon, the prophet ſaid, *Ferru mina'lmejdhumi cama teferru mina'l aſad*, or, 'Flee from a perſon afflicted with the 'judham, as you would flee from a lion.' The author of the *Bahhru'ljawahir*, or *Sea of Pearls*, ranks it as an infectious malady with the *meaſles*, the *ſmall pox*, and the *plague*. It is alſo *hereditary*, and, in that reſpect, claſſed by medical writers, with the *gout*, the *conſumption*, and the *white leproſy*.

A common cauſe of this diſtemper is the unwholeſome diet of the natives, many of whom are accuſtomed, after eating a quantity of *fiſh*, to ſwallow copious draughts of milk, which fail not to cauſe an accumulation of yellow and black bile, which mingles itſelf with the blood and corrupts it: but it has other cauſes; for a *Brahman*, who had never taſted *fiſh* in his life, applied lately to the compoſer of this eſſay, and appeared in the higheſt degree affected by

a corruption of blood; which he might have inherited, or acquired by other means. Thoſe whoſe religion permits them to eat *beef*, are often expoſed to the danger of heating their blood intenſely, through the knavery of the butchers in the *Bazar*, who fatten their calves with *Balawer*; and thoſe who are ſo ill-adviſed as to take *provocatives* (a folly extremely common in *India*) at firſt are inſenſible of the miſchief, but, as ſoon as the increaſed moiſture is diſperſed, find their whole maſs of blood inflamed, and, as it were, aduſt; whence ariſes the diſorder of which we now are treating. The *Perſian*, or venereal fire, generally ends in this malady; as one *Devi Praſad*, lately in the ſervice of Mr. *Vanſittart*, and ſome others, have convinced me, by an unreſerved account of their ſeveral caſes.

It may be here worth while to report a remarkable caſe, which was related to me by a man who had been afflicted with the *juzam* near four years; before which time he had been diſordered with *Perſian* fire, and, having cloſed an ulcer by the means of a ſtrong healing plaſter, was attacked by a violent pain in his joints. On this he applied to a *Cabiraja*, or *Hindu* phyſician, who gave him ſome pills, with a poſitive aſſurance, that the uſe of them would remove his pain in a few days; and in a few days it was, in fact, wholly removed; but, a very ſhort time after, the ſymptoms of the *juzam* appeared, which continually encreaſed to ſuch a degree, that his fingers and toes were on the point of dropping off. It was afterwards diſcovered, that the pills which he had taken were made of cinnabar, a common preparation of the *Hindus*; the heat of which had firſt ſtirred the humours; which, on ſtopping the external diſcharge, had fallen on the joints, and then had occaſioned a quantity of aduſt bile to mix itſelf with the blood and infect the whole maſs.

Of this dreadful complaint, however caufed, the firft fymptoms are a numbnefs and rednefs of the whole body, and principally of the face, an impeded hoarfe voice, thin hair and even baldnefs, offenfive perfpiration and breath, and whitlows on the nails. The cure is beft begun with copious bleeding, and cooling drink, fuch as a decoction of the *nilufer*, or *Nymphea*, and of violets, with fome dofes of manna: after which ftronger cathartics muft be adminiftered. But no remedy has proved fo efficacious as the pills compofed of arfenic and pepper: one inftance of their effect may here be mentioned, and many more may be added, if required.

In the month of *February*, the year juft mentioned, one *Shaikh Ramazani*, who then was an upper-fervant to the Board of Revenue, had fo corrupt a mafs of blood, that a black leprofy of his joints was approaching; and moft of his limbs began to be ulcerated. In this condition he applied to the writer, and requefted immediate affiftance. Though the diforderd ftate of his blood was evident on infpection, and required no particular declaration of it, yet many queftions were put to him; and it was clear, from his anfwers, that he had a confirmed *juzam*: he then loft a great deal of blood, and, after due preparation, took the arfenic-pills. After the firft week his malady feemed alleviated; in the fecond it was confiderably diminifhed; and, in the third, fo entirely removed, that the patient went into the bath of health, as a token that he no longer needed a phyfician.

IX.

ON THE INDIAN GAME OF CHESS.

BY THE PRESIDENT.

IF evidence be required to prove that Chefs was invented by the *Hindus*, we may be fatisfied with the teftimony of the *Perfians*; who, though as much inclined as other nations to appropriate the ingenious inventions of a foreign people, unanimoufly agree, that the game was imported from the weft of *India*, together with the charming fables of *Vifhnufarman*, in the fixth century of our æra. It feems to have been immemorially known In *Hinduftan* by the name of *Chaturanga*, that is, the four *angas*, or *members* of an army, which are faid in the *Amaracofha* to be *hafty-afwarat'hapadatam*, or *elephants*, *horfes*, *chariots*, and *foot-foldiers*; and in this fenfe the word is frequently ufed by epic poets in their defcriptions of real armies. By a natural corruption of the pure *Sanfcrit* word, it was changed by the old *Perfians* into *Chatrang*; but the *Arabs*, who foon after took poffeffion of their country, had neither the initial nor final letter of that word in their alphabet, and confequently altered it further into *Shatranj*, which found its way prefently into the modern *Perfian*, and at length into the dialects of *India*, where the true derivation of the name is known only to the learned. Thus has a very fignificant word in the facred language of the *Brahmans* been transformed by fucceffive changes into *axedraz*, *fcacchi*, *echecs*, *chefs*, and, by a whimfical concurrence of circumftances, given birth to the *Englifh* word *check*; and even a name to the *Exchequer* of *Great Britain*. The beautiful fimplicity and extreme perfection of the game, as it is

commonly played in *Europe* and *Aſia*, convince me that it was invented by one effort of ſome great genius; not completed by gradual improvements, but formed, to uſe the phraſe of *Italian* critics, *by the firſt intention*; yet of this ſimple game, ſo exquiſitely contrived, and ſo certainly invented in *India*, I cannot find any account in the claſſical writings of the *Brahmans*. It is, indeed, confidently aſſerted, that *Sanſcrit* books on Cheſs exiſt in this country; and, if they can be procured at *Banares*, they will aſſuredly be ſent to us. At preſent I can only exhibit a deſcription of a very ancient *Indian* game of the ſame kind; but more complex, and, in my opinion, more modern than the ſimple Cheſs of the *Perſians*. This game is alſo called *Chaturanga*, but more frequently *Chaturaji*, or the *Four Kings*, ſince it is played by four perſons repreſenting as many princes, two allied armies combating on each ſide. The deſcription is taken from the *Bhawiſhya Puran*, in which *Yudhiſht'hir* is repreſented converſing with *Vyaſa*, who explains at the king's requeſt the form of the fictitious warfare and the principal rules of it. "Having marked *eight* "ſquares on all ſides," ſays the ſage, "place the *red* "army to the eaſt, the *green* to the ſouth, the *yellow* "to the weſt, and the *black* to the north: let the "*elephant* ſtand on the left of the *king*; next to him, "the *horſe*; then the *boat*; and, before them all, "four *foot-ſoldiers*; but the *boat* muſt be placed in "the *angle* of the board." From this paſſage it clearly appears, that an army, with its four *angas*, muſt be placed on each ſide of the board, ſince an *elephant* could not ſtand in any other poſition on the *left* hand of each *king*; and *Radhacant* informed me, that the board conſiſted, like ours, of *ſixty-four* ſquares, half of them occupied by the forces, and half vacant. He added, that this game is mentioned in the oldeſt law-books, and that it was invented by the wife of *Ravan*, king of *Lanca*, in order to amuſe him

with an image of war, while his metropolis was closely besieged by *Rama*, in the second age of the world. He had not heard the story told by *Firdausi*, near the close of the *Shahnamah*; and it was probably carried into *Persia* from *Canyacuvja*, by *Borzu* the *favourite physician*, thence called *Vaidyaprya*, of the great *Anushiravan*; but he said that the *Brahmans* of *Gaur*, or *Bengal*, were once celebrated for superior skill in the game, and that his father, together with his spiritual preceptor *Jagannat'h*, now living at *Tribeni*, had instructed two young *Brahmans* in all the rules of it, and had sent them to *Jayanagar* at the request of the late *Raja*, who had liberally rewarded them. A *ship* or *boat* is substituted, we see, in this complex game for the *rat'h*, or armed *chariot*, which the *Bengalese* pronounce *rot'h*, and which the *Persians* changed into *rokh*, whence came the *rook* of some *European* nations; as the *vierge* and *fol* of the *French* are supposed to be corruptions of *ferze* and *fil*, the *prime minister* and *elephant* of the *Persians* and *Arabs*. It were in vain to seek an etymology of the word *rook* in the modern *Persian* language; for, in all the passages extracted from *Firdausi* and *Jami*, where *rokh* is conceived to mean a *hero* or a *fabulous bird*, it signifies, I believe, no more than a *cheek* or a *face*; as in the following description of a procession in *Egypt*:—
"When a thousand youths, like cypresses, box-trees, "and firs, with locks as fragrant, cheeks as fair, and "bosoms as delicate as lilies of the valley, were "marching gracefully along, thou wouldst have said "that the new spring was *turning his face* (not, as *Hyde* translates the words, *carried on rokhs*) from "station to station." And as to the battle of the *duwazdeh rakh*, which *D'Herbelot* supposes to mean *douze preux chevaliers*, I am strongly inclined to think that the phrase only signifies a combat of *twelve persons face to face*, or six on a side. I cannot agree with my friend *Radhacant*, that a *ship* is properly introduced

in this imaginary warfare inſtead of a *chariot*, in which the old *Indian* warriors conſtantly fought; for, though the *king* might be ſuppoſed to ſit in a *car*, ſo that the four *angas* would be complete, and though it may often be neceſſary in a real campaign to paſs rivers or lakes, yet no river is marked on the *Indian*, as it is on the *Chineſe* cheſs-board; and the intermixture of ſhips with horſes, elephants, and infantry embattled on a plain, is an abſurdity not to be defended. The uſe of *dice* may, perhaps, be juſtified in a repreſentation of war, in which *fortune* has unqueſtionably a great ſhare; but it ſeems to exclude cheſs from the rank which has been aſſigned to it among the ſciences, and to give the game before us the appearance of *whiſt*, except that pieces are uſed only, inſtead of cards which are held concealed: nevertheleſs, we find that the moves in the game deſcribed by *Vyaſa*, were to a certain degree regulated by *chance*; for he proceeds to tell his royal pupil, that, "if *cinque* be thrown, the "*king* or a *pawn* muſt be moved; if *quatre*, the "*elephant*; if *trois*, the *horſe*; and if *deux* the *boat*."

He then proceeds to the moves: "The *king* paſſes "freely on all ſides, but over *one* ſquare only; and "with the ſame limitation the *pawn* moves, but he "advances ſtraight forward, and kills his enemy "through an eagle; the *elephant* marches in all direc- "tions, as far as his driver pleaſes; the *horſe* runs "obliquely, traverſing three ſquares; and the *ſhip* "goes over two ſquares diagonally." The elephant, we find, has the powers of our *queen*, as we are pleaſed to call the *miniſter*, or *general*, of the *Perſians*; and the *ſhip* has the motion of the piece to which we give the unaccountable appellation of *biſhop*; but with a reſtriction which muſt greatly leſſen his value.

The bard next exhibits a few general rules and superficial directions for the conduct of the game: "the *pawns* and the *ship* both kill and may be voluntarily killed; while the *king*, the *elephant*, and the *horse* may slay the foe, but cannot expose themselves to be slain. Let each player preserve his own forces with extreme care, securing his *king* above all, and not sacrificing a superior to keep an inferior piece." Here the commentator on the *Puran* observes, that the *horse*, who has the choice of *eight* moves from any central position, must be preferred to the *ship*, who has only the choice of *four*; but this argument would not have equal weight in the common game, where the *bishop* and *tower* command a whole line, and where a knight is always of less value than a tower in action, or a bishop of that side on which the attack is begun. "It is by the overbearing power of the *elephant* that the king fights boldly; let the whole army, therefore, be abandoned, in order to secure the *elephant*: the king must never place one elephant before another, according to the rule of *Gotama*, unless he be compelled for want of room, for he would thus commit a dangerous fault; and, if he can slay one of two hostile elephants, he must destroy that on his left hand." The last rule is extremely obscure; but, as *Gotama* was an illustrious lawyer and philosopher, he would not have condescended to leave directions for the game of *Chaturanga*, if it had not been held in great estimation by the ancient sages of *India*.

All that remains of the passage, which was copied for me by *Radhacant* and explained by him, relates to the several modes in which a partial success or complete victory may be obtained by any one of the four players; for we shall see that, as if a dispute had arisen between two allies, one of the kings may assume the command of all the forces, and aim at separate con-

queſt. Firſt, " When any one king has placed himſelf
" on the ſquare of another king, which advantage is
" called *Sinhaſana*, or *the throne*, he wins a ſtake,
" which is doubled, if he kills the adverſe monarch
" when he ſeizes his place ; and, if he can ſeat himſelf
" on the throne of his ally, he takes the command of
" the whole army." Secondly, " If he can occupy ſuc-
" ceſſively the thrones of all the three princes, he ob-
" tains the victory, which is named *Chaturaji* ; and the
" ſtake is doubled if he kills the laſt of the three juſt
" before he takes poſſeſſion of his throne ; but if he
" kills him on his throne, the ſtake is quadrupled."
Thus, as the commentator remarks, in a real warfare, a
king may be conſidered as victorious when he ſeizes
the metropolis of his adverſary ; but if he can deſtroy
his foe, he diſplays greater heroiſm, and relieves his
people from any further ſolicitude. " Both in gaining
" the *Sinhaſana* and the *Chaturaji*," ſays *Vyaſa*, " the
" king muſt be ſupported by the *elephants*, or all the
" forces united." Thirdly, " When one player has
" his own king on the board, but the king of his
" partner has been taken, he may replace his captive
" ally, if he can ſeize both the adverſe kings ; or, if
" he cannot effect their capture, he may exchange his
" king for one of them, againſt the general rule,
" and thus redeem the allied prince, who will ſupply
" his place." This advantage has the name of *Nri-
pacriſhta*, or *recovered by the king* ; and the *Nauca-
criſhta* ſeems to be analogous to it, but confined to
the caſe of *ſhips*. Fourthly, " If a pawn can march
" to any ſquare on the oppoſite extremity of the board,
" except that of the king or that of the ſhip, he aſ-
" ſumes whatever power belonged to that ſquare ; and
" this promotion is called *Shatpada*, or the *ſix ſtrides*."
Here we find the rule, with a ſingular exception, con-
cerning the advancement of the *pawns*, which often
occaſions a moſt intereſting ſtruggle at our common
cheſs, and which has furniſhed the poets and moraliſts

of *Arabia* and *Perſia* with many lively reflections on human life. It appears that this privilege of *Shatpada* was not allowable, in the opinion of *Gotama*, when a player had three pawns on the board; but, when only one pawn and one ſhip remained, the pawn might advance even to the ſquare of a king or a ſhip, and aſſume the power of either. Fifthly, "According "to the *Rachdſas*, or *giants* (that is, the people of *Lanca*, where the game was invented) there could "be neither victory nor defeat if a king were left on the "plain without force: a ſituation which they named "*Cacacaſht'ha*." Sixthly, "If three ſhips happen to "meet, and the fourth can be brought up to them in "the remaining angle, this has the name of *Vrihan-"nauca*, and the player of the fourth ſeizes all the "others. Two or three of the remaining couplets are ſo dark, either from an error in the manuſcript or from the antiquity of the language, that I could not underſtand the *Pandit*'s explanation of them, and ſuſpect that they gave even him very indiſtinct ideas; but it would be eaſy, if it were worth while to play at the game by the preceding rules; and a little practice would perhaps make the whole intelligible. One circumſtance, in this extract from the *Puran*, ſeems very ſurprizing: all games of hazard are poſitively forbidden by *Menu*, yet the game of *Chaturanga*, in which dice are uſed, is taught by the great *Vyaſa* himſelf, whoſe law-tract appears with that of *Gotama* among the eighteen books which form the *Dhermaſaſtra*; but, as *Radhacant* and his preceptor *Jagannat'h* are both employed by government in compiling a digeſt of *Indian* laws, and as both of them, eſpecially the venerable ſage of *Tribeni*, underſtand the game, they are able I preſume to aſſign reaſons why it ſhould have been excepted from the general prohibition, and even openly taught by ancient and modern *Brahmans*.

X.

TWO INSCRIPTIONS

FROM THE VINDYA MOUNTAINS,

Translated from the Sanscrit by Charles Wilkins, Esq.

FIRST INSCRIPTION,

In a Cavern, called the Grot of the Seven Rishis, near Gaya.

1. ANANTA VARMA, master of the hearts of the people, who was the good son of *Sree Sardoola*, by his own birth and great virtues classed amongst the principal rulers of the earth, gladly called this statue of *Kreeshna*, of unsullied renown, confirmed in the world like his own reputation, and the image of *Kanteematee* *, to be deposited in this great mountain-cave.

2. *Sree Sardoola*, of established fame, jewel of the diadems of kings, emblem of time to the martial possessors of the earth, to the submissive the tree of the fruit of desire, a light to the Military Order, whose glory was not founded upon the feats of a single battle, the ravisher of female hearts, and the image of *Smara* †, became the ruler of the land.

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* *Radha*, the favourite mistress of *Kreeshna*.

† *Kama Deva*, the *Cupid* of the *Hindus*.

3. Wherever *Sree Sardoola* is wont to cast his own discordant sight towards a foe, and the fortunate star, his broad eye, is enflamed with anger between its expanded lids, *there* falleth a shower of arrows from the ear-drawn string of the bow of his son, the renowned *Ananta Varma*, the bestower of infinite hap-

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SECOND INSCRIPTION,

In a Cave behind Nagarjeni.

THE auspicious *Sree Yanja Varma*, whose movement was as the sportive elephant's in the season of lust, was like *Manoo* *, the appointer of the military station of all the chiefs of the earth: — by whose divine offerings, the God with a thousand eyes † being constantly invited, the emaciated *Powlomee* ‡, for a long time, sullied the beauty of her cheeks with falling tears.

2. *Ananta Varma* by name, the friend of strangers, renowned in the world in the character of valour, by nature immaculate as the lunar beams, and who is the offspring of *Sree Sardoola*:—By him this wonderful statue of *Bhootapatee* and of *Devee* ||, the Maker of all things visible and invisible and the granter of boons, which hath taken sanctuary in this cave, was caused to be made. May it protect the universe!

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* The first legislator of the *Hindus*.

† *Eendra* a deification of the Heavens.

‡ The wife of *Eendra*.

|| *Seeva*, or *Mahadeva* and his consort in one image, as a type of the deities, *Genitor* and *Genitrix*.

3. The ſtring of his expanded bow, charged with arrows and drawn to the extremity of the ſhoulder, burſteth the circle's centre. Of ſpacious brow, propitious diſtinction, and ſurpaſſing beauty, he is the image of the moon with an undiminiſhed countenance. *Ananta Varma* to the end! Of form like *Smara* * in exiſtence, he is ſeen with the conſtant and affectionate ſtanding with their tender and faſcinated eyes conſtantly fixed upon him.

4. From the machine his bow, reproacher of the crying *Koorara* †, bent to the extreme, he is endued with force; from his expanded virtue he is a provoker; by his good conduct his renown reacheth to afar; he is a hero by whoſe courſing ſteeds the elephant is diſturbed, and a youth who is the ſeat of ſorrow to the women of his foes. He is the director; and his name is *Ananta* ‡.

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* The Hindoo *Cupid*.

† A bird that is conſtantly making a noiſe before rain.

‡ This word ſignifies *eternal* or *infinite*.

XI.

A DESCRIPTION OF ASAM,

BY MOHAMMED CAZIM.

*Tranſlated from the Perſian, by Henry Vanſittart, Eſq.**

ASAM, which lies to the north-eaſt of *Bengal*, is divided into two parts by the river *Brahmaputra*, that flows from *Khata*. The northern portion is called *Uttarcul*, and the ſouthern *Dacſhincul*. *Uttarcul* begins at *Gowahutty*, which is the boundary of his Majeſty's territorial poſſeſſions, and terminates in mountains inhabited by a tribe called *Meeri Mechmi*. *Dacſhincul* extends from the village *Sidea* to the hills of *Strinagar*. The moſt famous mountains to the northward of *Uttarcul*, are thoſe of *Duleh* and *Landah*; and to the ſouthward of *Dacſhincul* are thoſe of *Namrup*, (*Camrup?*) ſituated four days journey above *Ghergong*, to which the *Raja* retreated. There is another chain of hills, which is inhabited by a tribe called *Nanac*, who pay no revenue to the *Raja*, but profeſs allegiance to him, and obey a few of his orders. But the † *Zemleh* tribe are entirely independent of him; and, whenever they find an opportunity, plunder the country contiguous to their mountains. *Aſam* is of an oblong figure; its length about 200 ſtandard coſs, and its breadth, from the northern to the ſouthern mountains, about eight days journey. From

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* This account of *Aſam* was tranſlated for the Society, but afterwards printed by the learned tranſlator as an appendix to his *Aalemgirnamah*. It is reprinted here, becauſe our government has an intereſt in being as well acquainted as poſſible with all the nations *bordering* on the *Britiſh* territories.

† In another copy, this tribe are called *Duſleh*.

Gowahutty to *Ghergong* are ſeventy-five ſtandard coſs: and from thence it is fifteen days journey to *Khoten*, which was the reſidence of *Peeran Wiſeh**, but is now called *Ava* †, and is the capital of the *Raja* of *Pegu*, who conſiders himſelf of the poſterity of that famous General. The firſt five days journey from the mountains of *Camrup*, is performed through foreſts, and over hills, which are arduous and difficult to paſs. You then travel eaſtward to *Ava* through a level and ſmooth country. To the northward is the plain of *Khata*, that has been before mentioned as the place from whence the *Brahmaputra* iſſues, which is afterwards fed by ſeveral rivers that flow from the ſouthern mountains of *Aſam*. The principal of theſe is the *Dhonec*, which has before occurred in this hiſtory: it joins that broad river at the village *Luckigereh*.

Between theſe rivers is an iſland well inhabited, and in an excellent ſtate of tillage. It contains a ſpacious, clear, and pleaſant country, extending to the diſtance of about fifty coſs. The cultivated tract is bounded by a thick foreſt, which harbours elephants, and where thoſe animals may be caught, as well as in four or five other foreſts of *Aſam*. If there be occaſion for them, five or ſix hundred elephants may be procured in a year. Acroſs the *Dhonec*, which is the ſide of *Ghergong*, is a wide, agreeable, and level country, which delights the heart of the beholder. The whole face of it is marked with population and tillage; and it preſents on every ſide charming proſ-

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* According to *Khondemir*, *Peeran Wiſeh* was one of the nobles of *Afraſiab*, King of *Turan*, contemporary with *Kaicaus*, ſecond Prince of the *Kianian* dynaſty. In the *Ferhung Jehangeery* and *Borhaun Katea* (two Perſian Dictionaries) *Peeran* is deſcribed as one of the *Pehlovan* or heroes of *Turan*, and General under *Afraſiab*, the name of whoſe father was *Wiſeh*.

† This is a palpable miſtake. *Khoten* lies to the north of *Himalaya*; and *Piran Viſah* could never have ſeen *Ava*.

pects of ploughed fields, harvests, gardens, and groves. All the island before described lies in *Dacshincul.* From the village *Salagereh* to the city of *Ghergong* is a space of about fifty coss, filled with such an uninterrupted range of gardens, plentifully stocked with fruit-trees, that it appears as one garden. Within them are the houses of the peasants, and a beautiful assemblage of coloured and fragrant herbs, and of garden and wild flowers blowing together. As the country is overflowed in the rainy season, a high and broad causeway has been raised for the convenience of travellers from *Salagereh* to *Ghergong*, which is the only uncultivated ground that is to be seen. Each side of this road is planted with shady bamboos, the tops of which meet, and are intertwined. Amongst the fruits which this country produces, are mangoes, plantains, jacks, oranges, citrons, limes, pine-apples, and *punialeh*, a species of *amleh*, which has such an excellent flavour, that every person who tastes it prefers it to the plum. There are also cocoa-nut trees, pepper-vines, *Areca* trees, and the *Sadij* *, in great plenty. The sugar-cane excels in softness and sweetness, and is of three colours, red, black, and white. There is ginger free from fibres, and betel-vines. The strength of vegetation and fertility of the soil are such, that whatever seed is sown, or slips planted, they always thrive. The environs of *Ghergong* furnish small apricots, yams, and pomegranates; but as these articles are wild, and not assisted by cultivation and engraftment, they are very indifferent. The principal crop of this country consists in rice and † *mash*. *Ades* is very scarce; and wheat and barley are never sown. The silks are excellent, and resemble

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* The *Sadij* is a long aromatic leaf, which has a pungent taste, and is called in *Sanscrit*, *Tejapatra*. In our botanical books it bears the name of *Malabathrum*, or the *Indian* Leaf.

† *Mash* is a species of grain, and *Ades* a kind of pea.

those of *China*; but they manufacture very few more than are required for use. They are successful in embroidering with flowers, and in weaving velvet and *tautbund*, which is a species of silk of which they make tents and * *kenauts*. Salt is a very precious and scarce commodity; it is found at the bottom of some of the hills, but of a bitter and pungent quality. A better sort is in common, which is extracted from the plantain-tree. The mountains inhabited by the tribe called *Nanac*, produce plenty of excellent *Lignum Aloes*, which a society of the natives import every year into *Asam*, and barter for salt and grain. This evil-disposed race of mountaineers are many degrees removed from the line of humanity, and destitute of the characteristical properties of a man. They go naked from head to foot, and eat dogs, cats, snakes, mice, rats, ants, locusts, and every thing of this sort which they can find. The hills of *Camrup*, *Sidea*, and *Lucstigereh*, supply a fine species of *Lignum Aloes*, which sinks in water. Several of the mountains contain musk-deer.

The country of *Uttarcul*, which is on the northern side of the *Brahmaputra*, is in the highest state of cultivation, and produces plenty of pepper and *Areca*-nuts. It even surpasses *Dacshincul* in population and tillage; but, as the latter contains a greater tract of wild forests, and places difficult of access, the rulers of *Asam* have chosen to reside in it for the convenience of control, and have erected in it the capital of the kingdom. The breadth of *Uttarcul*, from the banks of the river to the foot of the mountains, which is a cold climate, and contains snow, is various; but is nowhere less than fifteen coss, nor more than forty-five coss. The inhabitants of those

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* *Kenauts* are walls made to surround tents.

mountains are ſtrong, have a robuſt and reſpectable appearance, and are of the middling ſize. Their complexions, like thoſe of the natives of all cold climates, are red and white; and they have alſo trees and fruits peculiar to frigid regions. Near the fort of *Jam Dereh*, which is on the ſide of *Gowahutty*, is a chain of mountains, called the country of *Dereng*; all the inhabitants of which reſemble each other in appearance, manners, and ſpeech, but they are diſtinguiſhed by the names of their tribes, and places of reſidence. Several of theſe hills produce muſk, *kataus**, *bhoat* †, *peree*, and two ſpecies of horſes, called *goont* and *tanyans*. Gold and ſilver are procured here, as in the whole country of *Aſam*, by waſhing the ſand of the rivers. This, indeed, is one of the ſources of revenue. It is ſuppoſed that 12,000 inhabitants, and ſome ſay 20,000, are employed in this occupation; and it is a regulation, that each of theſe perſons ſhall pay a fixed revenue of a *tola* ‡ of gold to the *Raja*. The people of *Aſam* are a baſe and unprincipled nation, and have no fixed religion. They follow no rule but that of their own inclinations, and make the approbation of their own vicious minds the teſt of the propriety of their actions. They do not adopt any mode of worſhip practiſed either by *Heathens* or *Mohammedans*; nor do they concur with any of the known ſects which prevail amongſt mankind. Unlike the Pagans of *Hinduſtan*, they do not reject victuals which have been dreſſed by *Muſelmans*; and they abſtain from no fleſh

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* Kataus is thus deſcribed in the *Borhaun Katea*: "This word, "in the language of *Rum*, is a ſea-cow; the tail of which is hung "upon the necks of horſes, and on the ſummits of ſtandards. "Some ſay that it is a cow which lives in the mountains of "*Khata*." It here means the mountain-cow, which ſupplies the tail that is made into *chowries*; and in *Sanſcrit* is called *chamara*.

† *Bhoat* and *peree* are two kinds of blanket.

‡ Eighty *reti*-weights. See page 154, *note*.

except human. They even eat animals that have died a natural death; but, in conſequence of not being uſed to the taſte of ghee, they have ſuch an antipathy to this article, that if they diſcover the leaſt ſmell of it in their victuals, they have no reliſh for them. It is not their cuſtom to veil their women; for even the wives of the *Raja* do not conceal their faces from any perſon. The females perform work in the open air, with their countenances expoſed and heads uncovered. The men have often four or five wives each, and publicly buy, ſell, and change them. They ſhave their heads, beards, and whiſkers, and reproach and admoniſh every perſon who neglects this ceremony. Their language has not the leaſt affinity with that of *Bengal* *. Their ſtrength and courage are apparent in their looks; but their ferocious manners and brutal tempers are alſo betrayed by their phyſiognomy. They are ſuperior to moſt nations in corporal force and hardy exertions. They are enterprizing, ſavage, fond of war, vindictive, treacherous, and deceitful. The virtues of compaſſion, kindneſs, friendſhip, ſincerity, truth, honour, good faith, ſhame, and purity of morals, have been left out of their compoſition. The ſeeds of tenderneſs and humanity have not been ſown in the field of their frames. As they are deſtitute of the mental garb of manly qualities, they are alſo deficient in the dreſs of their bodies. They tie a cloth round their heads, and another round their loins, and throw a ſheet upon their ſhoulder; but it is not cuſtomary in that country to wear turbans, robes, drawers, or ſhoes. There are no buildings of brick or ſtone, or with walls of earth, except the gates of the city of *Ghergong*, and ſome of their idolatrous temples. The rich and poor conſtruct their habita-

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* This is an error: young *Brahmens* often come from *Aſam* to *Nadiya* for inſtruction; and their vulgar dialect is underſtood by the *Bengal* teachers.

tions of wood, bamboos, and ſtraw. The *Raja* and his courtiers travel in ſtately litters; but the opulent and reſpectable perſons amongſt his ſubjects are carried in lower vehicles, called doolies. *Aſam* produces neither horſes *, camels, nor aſſes; but thoſe cattle are ſometimes brought thither from other countries. The brutal inhabitants, from a congenial impulſe, are fond of ſeeing and keeping aſſes, and buy and ſell them at a high price; but they diſcover the greateſt ſurprize at ſeeing a camel; and are ſo afraid of a horſe, that if one trooper ſhould attack a hundred armed *Aſamians*, they would all throw down their arms and flee; or, ſhould they not be able to eſcape, they would ſurrender themſelves priſoners. Yet, ſhould one of that deteſtable race encounter two men of another nation on foot, he would defeat them.

The ancient inhabitants of this country are divided into two tribes, the *Aſamians* and the *Cultanians*. The latter excel the former in all occupations except war and the conduct of hardy enterprizes, in which the former are ſuperior. A body-guard of ſix or ſeven thouſand *Aſamians*, fierce as demons, of unſhaken courage, and well provided with warlike arms and accoutrements, always keep watch near the *Raja*'s ſitting and ſleeping apartments; theſe are his loyal and confidential troops and patrol. The martial weapons of this country are the muſquet, ſword, ſpear, and arrow and bow of bamboo. In their forts and boats they have alſo plenty of cannon, *zerbzen* † and *ramchangee*; in the management of which they are very expert.

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* As the author has aſſerted that two ſpecies of horſes, called *goont* and *tanyans*, are produced in *Dereng*, we muſt ſuppoſe that this is a different country from *Aſam*.

† Swivels.

Whenever any of the *Rajahs*, magiſtrates, or principal men die, they dig a large cave for the deceaſed, in which they inter his women, attendants, and ſervants, and ſome of the magnificent equipage and uſeful furniture which he poſſeſſed in his life-time; ſuch as elephants, gold and ſilver, *badcaſh* (large fans) carpets, clothes, victuals, lamps, with a great deal of oil, and a torch-bearer; for they conſider theſe articles as ſtores for a future ſtate. They afterwards conſtruct a ſtrong roof over the cave upon thick timbers. The people of the army entered ſome of the old caves, and took out of them the value of 90,000 rupees, in gold and ſilver. But an extraordinary circumſtance is ſaid to have happened, to which the mind of man can ſcarcely give credit, and the probability of which is contradicted by daily experience. It is this: All the nobles came to the imperial general and declared, with univerſal agreement, that a golden betel-ſtand was found in one of the caves that was dug eighty years before, which contained betel-leaf quite green and freſh: but the authenticity of this ſtory reſts upon report.

Ghergong has four gates, conſtructed of ſtone and earth; from each of which the *Raja*'s palace is diſtant three coſs. The city is encompaſſed with a fence of bamboos; and within it high and broad cauſeways have been raiſed for the convenience of paſſengers during the rainy ſeaſon. In the front of every man's houſe is a garden, or ſome cultivated ground. This is a fortified city, which encloſes villages and tilled fields. The *Raja*'s palace ſtands upon the bank of the *Degoo*, which flows throughout the city. This river is lined on each ſide with houſes; and there is a ſmall market, which contains no ſhopkeepers except ſellers of betel. The reaſon is, that it is not cuſtomary for the inhabitants to buy proviſions for daily uſe, becauſe they lay up a ſtock for themſelves, which laſts

them a year. The *Raja*'s palace is ſurrounded by a cauſeway, planted on each ſide with a cloſe hedge of bamboos, which ſerves inſtead of a wall. On the outſide there is a ditch, which is always full of water. The circumference of the encloſure is one coſs and fourteen jerebs. Within it have been built lofty halls and ſpacious apartments for the *Raja*, moſt of them of wood, and a few of ſtraw, which are called *chuppers*. Amongſt theſe is a *diwan khanah*, or public ſaloon, one hundred and fifty cubits long, and forty broad, which is ſupported by ſixty-ſix wooden pillars, placed at an interval of about four cubits from each other. The *Raja*'s ſeat is adorned with lattice-work and carving. Within and without have been placed plates of braſs, ſo well poliſhed, that when the rays of the ſun ſtrike upon them, they ſhine like mirrors. It is an aſcertained fact, that 3000 carpenters and 1200 labourers were conſtantly employed on this work, during two years before it was finiſhed. When the *Raja* ſits in this chamber, or travels, inſtead of drums and trumpets, they beat the * *dhol* and *dand*. The latter is a round thick inſtrument made of copper, and is certainly the ſame as the drum †, which it was cuſtomary, in the time of the ancient kings, to beat in battles and marches.

The *Rajas* of this country have always raiſed the creſt of pride and vainglory, and diſplayed an oſtentatious appearance of grandeur, and a numerous train of attendants and ſervants. They have not bowed the head of ſubmiſſion and obedience, nor have they paid tribute or revenue to the moſt powerful monarch; but they have curbed the ambition, and

* The *dhol* is a kind of drum, which is beaten at each end.

† This is a kind of kettle-drum, and is made of a compoſition of ſeveral metals.

checked the conquefts, of the moft victorious princes of *Hinduftan*. The folution of the difficulties attending a war againft them, has baffled the penetration of heroes who have been ftiled Conquerors of the World. Whenever an invading army has entered their territories, the *Afamians* have covered themfelves in ftrong pofts, and have diftreffed the enemy by ftratagems, furprifes, and alarms, and by cutting off their provifions. If thefe means have failed, they have declined a battle in the field, but have carried the peafants into the mountains, burnt the grain, and left the country empty. But when the rainy feafon has fet in upon the advancing enemy, they have watched their opportunity to make excurfions, and vent their rage; the famifhed invaders have either become their prifoners, or been put to death. In this manner powerful and numerous armies have been funk in that whirlpool of deftruction, and not a foul has efcaped.

Formerly *Hufain Shah*, a king of *Bengal*, undertook an expedition againft *Afam*, and carried with him a formidable force in cavalry, infantry, and boats. The beginning of this invafion was crowned with victory. He entered the country, and erected the ftandard of fuperiority and conqueft. The *Raja* being unable to encounter him in the field, evacuated the plains, and retreated to the mountains. *Hufain* left his fon, with a large army, to keep poffeffion of the country, and returned to *Bengal*. The rainy feafon commenced, and the roads were fhut up by inundation. The *Raja* defcended from the mountains, furrounded the *Bengal* army, fkirmifhed with them, and cut off their provifions, till they were reduced to fuch ftraits, that they were all, in a fhort time, either killed or made prifoners.

In the ſame manner *Mohammed Shah*, the ſon of *Togluc Shah*, who was king of ſeveral of the provinces of *Hinduſtan*, ſent a well-appointed army of an hundred thouſand cavalry to conquer *Aſam*; but they were all devoted to oblivion in that country of enchantment; and no intelligence or veſtige of them remained. Another army was diſpatched to revenge this diſaſter; but when they arrived in *Bengal*, they were panic-ſtruck, and ſhrunk from the enterprize; becauſe if any perſon paſſes the frontier into that diſtrict, he has not leave to return. In the ſame manner, none of the inhabitants of that country are able to come out of it; which is the reaſon that no accurate information has hitherto been obtained relative to that nation. The natives of *Hinduſtan* conſider them as wizards and magicians, and pronounce the name of that country in all their incantations and counter-charms. They ſay that every perſon who ſets his foot there, is under the influence of witchcraft, and cannot find the road to return.

*Jeidej Sing**, the *Raja of Aſcan*, bears the title of *Swergi*, or *Celeſtial*. *Swerg*, in the *Hinduſtani* language, means heaven. That frantic and vainglorious prince is ſo exceſſively fooliſh and miſtaken, as to believe that his vicious anceſtors were ſovereigns of the heavenly hoſt; and that one of them, being inclined to viſit the earth, deſcended by a golden ladder. After he had been employed ſome time in regulating and governing his new kingdoms, he became ſo attached to it, that he fixed his abode in it, and never returned.

In ſhort, when we conſider the peculiar circumſtances of *Aſam*; that the country is ſpacious, popu-

* Properly *Jayadhwaja Sinha*, or *the Lion with banners of conqueſt*.

lous, and hard to be penetrated; that it abounds in perils and dangers; that the paths and roads are beset with difficulties; that the obstacles to the conquest of it are more than can be described; that the inhabitants are a savage race, ferocious in their manners, and brutal in their behaviour; that they are of a gigantic appearance, enterprising, intrepid, treacherous, well armed, and more numerous than can be conceived; that they resist and attack the enemy from secure posts, and are always prepared for battle; that they possess forts as high as heaven, garrisoned by brave soldiers, and plentifully supplied with warlike stores, the reduction of each of which would require a long space of time; that the way was obstructed by thick and dangerous bushes, and broad and boisterous rivers: when we consider these circumstances, we shall wonder that this country, by the aid of *God*, and the auspices of his Majesty, was conquered by the imperial army, and became a place for erecting the standard of the faith. The haughty and insolent heads of several of the detestable *Asamians*, who stretch the neck of pride, and who are devoid of religion and remote from *God*, were bruised by the hoofs of the horses of the victorious warriors. The *Musselman* heroes experienced the comfort of fighting for their religion; and the blessings of it reverted to the sovereignty of his just and pious Majesty.

The *Raja*, whose soul had been enslaved by pride, who had been bred up in the habit of presuming on the stability of his own government, never dreamt of this reverse of fortune; but being now overtaken by the punishment due to his crimes, fled, as has been before mentioned, with some of his nobles, attendants, and family, and a few of his effects, to the mountains of *Camrup*. That spot, by its bad air and water, and confined space, is rendered the worst place in the world, or rather, it is in one of the pits of hell,

The *Raja*'s officers and folders, by his orders, croffed the *Dhonec*, and fettled in the fpacious ifland between that and the *Brahmaputra*, which contains numerous forefts and thickets. A few took refuge in other mountains, and watched an opportunity of committing hoftilities.

Camrup is a country on the fide of *Dacfhincul*, fituated between three high mountains, at the diftance of four days journey from *Ghergong*. It is remarkable for bad water, noxious air, and confined profpects. Whenever the *Raja* ufed to be angry with any of his fubjects, he fent them thither. The roads are difficult to pafs, infomuch that a foot-traveller proceeds with the greateft inconvenience. There is one road wide enough for a horfe; but the beginning of it contains thick forefts for about half a cofs. Afterwards there is a defile, which is ftony and full of water. On each fide is a mountain towering to the fky.

The Imperial General remained fome days in *Ghergong*, where he was employed in regulating the affairs of the country, encouraging the peafants, and collecting, the effects of the *Raja*. He repeatedly read the *Khotbeh*, or prayer, containing the name and title of the Prince of the Age, King of Kings, *Alemgeer*, Conqueror of the World; and adorned the faces of the coins with the imperial impreffion. At this time there were heavy fhowers, accompanied with violent wind, for two or three days; and all the figns appeared of the rainy feafon, which in that country fets in before it does in *Hinduftan*. The General exerted himfelf in eftablifhing pofts, and fixing guards, for keeping open the roads and fupplying the army with provifions. He thought now of fecuring himfelf during the rains, and determined, after the fky fhould be cleared from the clouds, the

lightning ceaſe to illuminate the air, and the ſwelling of the water ſhould ſubſide, that the army ſhould again be ſet in motion againſt the *Raja* and his attendants, and be employed in delivering the country from the evils of their exiſtence.

The author then mentions ſeveral ſkirmiſhes, which happened between the *Raja*'s forces and the Imperial troops; in which the latter were always victorious. He concludes thus:

"At length all the villages of *Dacſhincul* fell into the poſſeſſion of the Imperial army. Several of the inhabitants and peaſants, from the diffuſion of the fame of his Majeſty's kindneſs, tenderneſs, and juſtice, ſubmitted to his government, and were protected in their habitations and property. The inhabitants of *Uttercul* alſo became obedient to his commands. His Majeſty rejoiced when he heard the news of this conqueſt, and rewarded the General with a coſtly dreſs, and other diſtinguiſhing marks of his favour."

The narrative, to which this is a ſupplement, gives a conciſe hiſtory of the military expedition into *Aſam*. In this deſcription the author has ſtopt at a period when the Imperial troops had poſſeſſed themſelves of the capital, and were maſters of any part of the plain country which they choſe to occupy or over-run. The ſequel diminiſhes the credit of the conqueſt, by ſhowing that it was temporary, and that the *Raja* did not forget his uſual policy of haraſſing the invading army during the rainy ſeaſon: but this conduct produced only the effect of diſtreſſing and diſguſting it with the ſervice, inſtead of abſolutely deſtroying it, as his predeceſſors had deſtroyed former adventurers. Yet the concluſion of this war is far from weakening the panegyric, which the author has paſſed upon the Imperial General, to whom a difference of ſitua-

tion afforded an opportunity of difplaying additional virtues, and of clofing that life with heroic fortitude which he had always hazarded in the field with martial fpirit. His name and titles were, *Mir Jumleh, Moazzim Khan, Khani Khanan, Sipahi Salar.*

REMARK.

The preceding account of the *Afamians*, who are probably fuperior in all refpects to the *Moguls*, exhibits a fpecimen of the black malignity and frantic intolerance with which it was ufual, in the reign of *Aurangzib*, to treat all thofe whom the crafty, cruel, and avaricious emperor was pleafed to condemn as infidels and barbarians.

XII.

ON THE MANNERS, RELIGION, AND LAWS OF THE CUCIS, OR MOUNTAINEERS OF TIPRA.

Communicated, in Persian, by John Rawlins, Esq.

THE inhabitants of the mountainous districts to the east of *Bengal* gave the name of *Patiyan* to the Being who created the universe; but they believe that a deity exists in every tree, that the sun and moon are Gods, and that whenever they worship those subordinate divinities, *Patiyan* is pleased.

If any one among them put another to death, the chief of the tribe, or other persons who bear no relation to the deceased, have no concern in punishing the murderer; but, if the murdered person has a brother, or other heir, he may take blood; nor has any man whatever a right to prevent or oppose such retaliation.

When a man is detected in the commission of theft or other atrocious offence, the chieftain causes a recompense to be given to the complainant, and reconciles both parties; but the chief himself receives a customary fine: and each party gives a feast of pork, or other meat, to the people of his respective tribe.

In ancient times it was not a custom among them to cut off the heads of the women whom they found in the habitations of their enemies; but it happened

once that a woman aſked another why ſhe came ſo late to her buſineſs of ſowing grain: ſhe anſwered, that her huſband was gone to battle, and that the neceſſity of preparing food and other things for him had occaſioned her delay. This anſwer was overheard by a man at enmity with her huſband; and he was filled with reſentment againſt her, conſidering, that, as ſhe had prepared food for her huſband for the purpoſe of ſending him to battle againſt his tribe, ſo, in general, if women were not to remain at home, their huſbands could not be ſupplied with proviſion, and conſequently could not make war with advantage. From that time it became a conſtant practice to cut off the heads of the enemy's women; eſpecially if they happen to be pregnant, and therefore confined to their houſes. And this barbarity is carried ſo far, that if a *Cuci* aſſail the houſe of an enemy, and kill a woman with child, ſo that he may bring two heads, he acquires honour and celebrity in his tribe, as the deſtroyer of two foes at once.

As to the marriages of this wild nation; when a rich man has made a contract of marriage, he gives four or five head of *gayals* (the cattle of the mountains) to the father and mother of the bride, whom he carries to his own houſe: her parents then kill the *gayals*, and, having prepared fermented liquors and boiled rice, with other eatables, invite the father, mother, brethren, and kindred of the bridegroom to a nuptial entertainment. When a man of ſmall property is inclined to marry, and a mutual agreement is made, a ſimilar method is followed in a lower degree: and a man may marry any woman, except his own mother. If a married couple live cordially together, and have a ſon, the wife is fixed and irremoveable; but, if they have no ſon, and eſpecially if they live together on bad terms, the huſband may divorce his wife and marry another woman.

They have no idea of heaven or hell, the reward of good, or the puniſhment of bad actions; but they profeſs a belief, that when a perſon dies, a certain ſpirit comes and ſeizes his ſoul, which he carries away; and that whatever the ſpirit promiſes to give at the inſtant when the body dies, will be found and enjoyed by the dead; but that, if any one ſhould take up the corſe and carry it off, he would not find the treaſure.

The food of this people conſiſts of elephants, hogs, deer, and other animals; of which, if they find the carcaſes or limbs in the foreſts, they dry and eat them occaſionally.

When they have reſolved on war, they ſend ſpies before hoſtilities are begun, to learn the ſtations and ſtrength of the enemy, and the condition of the roads; after which they march in the night; and two or three hours before daylight, make a ſudden aſſault with ſwords, lances, and arrows. If their enemies are compelled to abandon their ſtation, the aſſailants inſtantly put to death all the males and females who are left behind, and ſtrip the houſes of all their furniture; but, ſhould their adverſaries, having gained intelligence of the intended aſſault, be reſolute enough to meet them in battle, and ſhould they find themſelves overmatched, they ſpeedily retreat and quietly return to their own habitations. If at any time they ſee a ſtar very near the moon, they ſay, "to-night we ſhall un- "doubtedly be attacked by ſome enemy;" and they paſs that night under arms with extreme vigilance. They often lie in ambuſh in a foreſt near the path where their foes are uſed to paſs and repaſs, waiting for the enemy with different ſorts of weapons, and killing every man or woman who happens to paſs by. In this ſituation, if a leech, or a worm, or a ſnake ſhould bite one of them, he bears the pain in perfect ſilence;

and whoever can bring home the head of an enemy which he has cut off, is ſure to be diſtinguiſhed and exalted in his ſtation. When two hoſtile tribes appear to have equal force in battle, and neither has hopes of putting the other to flight, they make a ſignal of pacific intentions, and, ſending agents reciprocally, ſoon conclude a treaty; after which they kill ſeveral head of *gayals* and feaſt on their fleſh, calling on the ſun and moon to bear witneſs of the pacification: but if one ſide, unable to reſiſt the enemy, be thrown into diſorder, the vanquiſhed tribe is conſidered as tributary to the victors, who every year receive from them a certain number of *gayals*, wooden diſhes, weapons, and other acknowledgment of vaſſalage. Before they go to battle, they put a quantity of roaſted *alus* (eſculent roots like *potatoes*) and paſte of rice-flour into the hollow of bamboos, and add to them a proviſion of dry rice, with ſome leathern bags full of liquor: then they aſſemble and march with ſuch celerity, that in one day they perform a journey ordinarily made by letter carriers in three or four days, ſince they have not the trouble and delay of dreſſing victuals. When they reach the place to be attacked, they ſurround it in the night, and, at early dawn, enter it, putting to death both young and old, women and children, except ſuch as they chuſe to bring away captive. They put the heads which they cut off into leathern bags; and if the blood of their enemies be on their hands they take care not to waſh it off. When, after this ſlaughter, they take their own food, they thruſt a part of what they eat into the mouths of the heads which they have brought away, ſaying to each of them, 'Eat, quench thy thirſt, and ſatisfy thy 'appetite. As thou haſt been ſlain by my hand, ſo 'may thy kinſmen be ſlain by my kinſmen!' During their journey, they have uſually two ſuch meals; and every watch, or two watches, they ſend intelligence

of their proceedings to their families. When any of them sends word that he has cut off the head of an enemy, the people of his family, whatever be their age or sex, express great delight, making caps and ornaments of red and black ropes; then filling some large vessels with fermented liqours, and decking themselves with all the trinkets they possess, they go forth to meet the conqueror, blowing large shells and striking plates of metal, with other rude instruments of music. When both parties are met they show extravagant joy, men and women dancing and singing together; and if a married man has brought an enemy's head, his wife wears a head-dress with gay ornaments, the husband and wife alternately pour fermented liquor into each other's mouths, and she washes his bloody hands with the same liquor which they are drinking; thus they go revelling, with excessive merriment to their place of abode; and, having piled up the heads of their enemis in the court-yard of their chieftain's house, they sing and dance round the pile; after which they kill some *gayals* and hogs with their spears, and, having boiled the flesh, make a feast of it, and drink the fermented liquor. The richer men of this race fasten the heads of their foes on a bamboo, and fix it on the graves of their parents; by which act they acquire great reputation. He who brings back the head of a slaughtered enemy, receives presents from the wealthy of cattle and spirituous liquors; and if any captives are brought alive, it is the prerogative of those chieftains who were not in the campaign, to strike off the heads of the captives. Their weapons are made by particular tribes; for some of them are unable to fabricate instruments of war.

In regard to their civil institutions, the whole management of their household affairs belongs to the women; while the men are employed in clearing fo-

refts, building huts, cultivating land, making war, or hunting game and wild beafts. Five days (they never reckon by months or years) after the birth of a male child, and three days after that of a female, they entertain their family and kinfmen with boiled rice and fermented liquor; and the parents of the child partake of the feaft. They begin the ceremony with fixing a pole in the court-yard; and then, killing a *gayal* or a hog with a lance, they confecrate it to their deity; after which all the party eat the flefh and drink liquor, clofing the day with dancing and with fongs. If any one among them be fo deformed, by nature or by accident, as to be unfit for the propagation of his fpecies, he gives up all thought of keeping houfe, and begs for his fubfiftence, like a religious mendicant, from door to door, continually dancing and finging. When fuch a perfon goes to the houfe of a rich and liberal man, the owner of the houfe ufually ftrings together a number of white and red ftones, and fixes one end of the ftring on a long cane, fo that the other end may hang down to the ground; then, paying a kind of fuperftitious homage to the pebbles, he gives alms to the beggar; after which he kills a *gayal* and a hog, and fome other quadrupeds, and invites his tribe to a feaft. The giver of fuch an entertainment acquires extraordinary fame in the nation: and all unite in applauding him with every token of honour and reverence.

When a *Cuci* dies, all his kinfmen join in killing a hog and a *gayal*; and, having boiled the meat, pour fome liquor into the mouth of the deceafed, round whofe body they twift a piece of cloth by way of fhroud. All of them tafte the fame liquor, as an offering to his foul; and this ceremony they repeat at intervals for feveral days. Then they lay the body on a ftage, and, kindling a fire under it, pierce it with a fpit, and

dry it: when it is perfectly dried they cover it with two or three folds of cloth; and, enclosing it in a little case within a chest, bury it under ground. All the fruits and flowers that they gather within a year after the burial, they scatter on the grave of the deceased; but some bury their dead in a different manner, covering them first with a shroud, then with a mat of woven reeds, and hanging them on a high tree. Some, when the flesh is decayed, wash the bones, and keep them dry in a bowl, which they open on every sudden emergence; and fancying themselves at a consultation with the bones, pursue whatever measures they think proper, alledging, that they act by the command of their departed parents and kinsmen. A widow is obliged to remain a whole year near the grave of her husband, where her family bring her food: if she die within the year, they mourn for her; if she live, they carry her back to her house, where all her relations are entertained with the usual feast of the *Cuci*.

If the deceased leave three sons, the eldest and the youngest share all his property, but the middle son takes nothing: if he have no sons, his estate goes to his brothers; and if he have no brothers, it escheats to the chief of the tribe.

NOTE.

A party of *Cuci* visited the late CHARLES CROFTES, Esq. at *Jafarabad* in the spring of 1776, and entertained him with a dance; they promised to return after their harvest, and seemed much pleased with their reception.

XIII.

ON THE SECOND CLASSICAL BOOK OF THE CHINESE.

BY THE PRESIDENT.

THE vicinity of *China* to our *Indian* territories from the capital of which there are not more than *six hundred miles* to the province of *Yunan*, must necessarily draw our attention to that most ancient and wonderful empire, even if we had no commercial intercourse with its more distant and maritime provinces; and the benefits that might be derived from a more intimate connection with a nation long famed for their useful arts and for the valuable productions of their country, are too apparent to require any proofs or illustration. My own inclinations and the course of my studies lead me rather to consider at present their *laws*, *politics*, and *morals*, with which their general literature is closely blended, than their manufactures and trade: nor will I spare either pains or expense to procure translations of their most approved *law tracts*, that I may return to *Europe* with distinct ideas drawn from the fountain-head of the wisest *Asiatic* legislation. It will probably be a long time before accurate returns can be made to my enquiries concerning the *Chinese Laws*; and, in the interval, the Society will not, perhaps be displeased to know that the translation of a most venerable and excellent work may be expected from *Canton* through the kind assistance of an inestimable correspondent.

According to a *Chinese* writer, named *Li Yang Ping*, " the ancient characters used in his country " were the outlines of visible objects, earthly and

‘ celeſtial: but as things merely intellectual could
‘ not be expreſſed by thoſe figures, the grammarians
‘ of *China* contrived to repreſent the various opera-
‘ tions of the mind by metaphors drawn from the
‘ productions of nature: thus the idea of roughneſs
‘ and of rotundity, of motion and reſt, were con-
‘ veyed to the eye by ſigns repreſenting a mountain,
‘ the ſky, a river and the earth; the figures of the
‘ ſun, the moon, and the ſtars, differently combined,
‘ ſtood for ſmoothneſs and ſplendour, for any thing
‘ artfully wrought, or woven with delicate workman-
‘ ſhip; extenſion, growth, increaſe, and many other
‘ qualities, were painted in characters taken from
‘ clouds, from the firmament, and from the vege-
‘ table part of the creation; the different ways of
‘ moving, agility and ſlowneſs, idleneſs and dili-
‘ gence, were expreſſed by various inſects, birds,
‘ fiſh, and quadrupeds. In this manner paſſions
‘ and ſentiments were traced by the pencil, and ideas
‘ not ſubject to any ſenſe were exhibited to the ſight,
‘ until by degrees new combinations were invented,
‘ new expreſſions added; the characters deviated
‘ imperceptibly from their primitive ſhape, and the
‘ *Chineſe* language became not only clear and forci-
‘ ble, but rich and elegant in the higheſt degree.’

In this language, ſo ancient and ſo wonderfully compoſed, are a multitude of books abounding in uſeful, as well as agreeable, knowledge; but the higheſt claſs conſiſts of *Five* works; one of which, at leaſt, every *Chineſe* who aſpires to literary honours muſt read again and again, until he poſſeſs it perfectly.

The *firſt* is purely *Hiſtorical*, containing annals of the empire from the *two-thouſand three-hundred thirty-ſeventh* year before CHRIST: it is entitled *Shuking*, and a verſion of it has been publiſhed in *France*; to

which country we are indebted for the moſt authentic and moſt valuable ſpecimens of *Chineſe* hiſtory and literature, from the compoſitions which preceded thoſe of *Homer* to the poetical works of the preſent Emperor, who ſeems to be a man of the brighteſt genius and the moſt amiable affections. We may ſmile, if we pleaſe, at the levity of the *French*, as they laugh without ſcruple at our ſerioufneſs: but let us not ſo far undervalue our rivals in arts and in arms, as to deny them their juſt commendation, or to relax our efforts in that noble ſtruggle, by which alone we can preſerve our own eminence.

The ſecond claſſical work of the *Chineſe* contains *three hundred* odes, or ſhort poems, in praiſe of ancient ſovereigns and legiſlators, or deſcriptive of ancient manners, and recommending an imitation of them in the diſcharge of all public and domeſtic duties: they abound in wiſe maxims and excellent precepts, 'their whole doctrine,' according to *Cun-fu-tſu*, in the *Lunyu* or *Moral Diſcourſes*, 'being re-'ducible to this grand rule, that we ſhould not even 'entertain a thought of any thing baſe or culpable;' but the copies of the *Shi King*, for that is the title of the book, are ſuppoſed to have been much disfigured, ſince the time of that great philoſopher, by ſpurious paſſages and exceptionable interpolations; and the ſtyle of the poems is in ſome parts too metaphorical, while the brevity of other parts renders them obſcure; though many think even this obſcurity ſublime and venerable, like that of ancient cloyſters and temples, '*Shedding* as *Milton* expreſſes it, '*a* '*dim religious light*.' There is another paſſage in the *Lunyu*, which deſerves to be ſet down at length: 'Why, my ſons, do you not ſtudy the book of Odes? 'If we creep on the ground, if we lie uſeleſs and 'inglorious, thoſe poems will raiſe us to true glory:

'in them we see, as in a mirror, what may best be-
'come us, and what will be unbecoming; by their
'influence we shall be made social, affable, benevo-
'lent; for as music combines sounds in just melody,
'so the ancient poetry tempers and composes our
'passions: the Odes teach us our duty to our parents
'at home, and abroad to our prince; they instruct
'us also delightfully in the various productions of
'nature.' 'Hast thou studied,' said the philosopher
to his son *Peyu*, 'the first of the three hundred Odes
'on the nuptials of Prince *Venvam* and the virtuous
'*Tai Jin*? He who studies them not resembles a
'man with his face against a wall, unable to advance
'a step in virtue and wisdom.' Most of those Odes
are near *three thousand* years old, and some, if we
give credit to the *Chinese* annals, considerably older;
but others are somewhat more recent, having been
composed under the later emperors of the *third*
family, called *Sheu*. The work is printed in *four*
volumes; and towards the end of the *first*, we find
the Ode, which *Couplet* has accurately translated at
the beginning of the *Tahio*, or *Great Science*, where
it is finely amplified by the philosopher: I pro-
duce the original from the *Shi King* itself, and from
the book in which it is cited, together with a dou-
ble version, one verbal and another metrical; the
only method of doing justice to the poetical com-
positions of the *Asiatics*. It is a panegyric on *Vucun*,
Prince of *Guey* in the province of *Honang*, who died,
near a century old in the *thirteenth* year of the empe-
ror *Pingvang*, *seven hundred and thirty-six years* before
the birth of *Christ* or *one hundred and forty-eight* ac-
croding to *Sir Isacc Newton*, after the taking of *Troy*;
so that the *Chinese* Poet might have been contempo-
rary with *Hesiod* and *Homer*, or at least, must have
written the Ode before the *Iliad* and *Odyssey* were
carried into *Greece* by *Lycurgus*.

The verbal tranflation of the thirty two original characters is this:

1 2 4 3
'Behold yon reach of *the river* Ki;
5 6 7 8
'Its green reeds how luxuriant! how luxuriant!
9 11 12 10
'Thus is our prince adorned with virtues;
13 14 15 16
'As a carver, as a filer, of ivory,
17 18 19 20
'As a cutter, as a polifher, of gems.
21 22
'O how elate and fagacious; O how dauntlefs and composed!
23 24
'How worthy of fame! How worthy of reverence!
25 27 28 26
'We have a prince adorned with virtues,
29 30 31 32
'Whom to the end *of time* we cannot forget.'

THE PARAPHRASE.

Behold, where yon blue riv'let glides
Along the laughing dale;
Light reeds bedeck its verdant fides,
And frolic in the gale:

So fhines our Prince! In bright array
The Virtues round him wait;
And fweetly fmil'd th' aufpicious day,
That rais'd him o'er our ftate.

As pliant hands in fhapes refin'd
Rich iv'ry carve and fmoothe,
His *Laws* thus mould each ductile mind,
And every paffion foothe.

As gems are taught by patient art
 In ſparkling ranks to beam,
With *manners* thus he forms the heart,
 And ſpreads a gen'ral gleam.

What ſoft, yet awful, dignity!
 What meek, yet manly, grace!
What ſweetneſs dances in his eye,
 And bloſſoms in his face!

So ſhines our Prince! A ſky-born crowd
 Of Virtues round him blaze:
Ne'er ſhall Oblivion's murky cloud
 Obſcure his deathleſs praiſe.

The prediction of the poet has hitherto been accompliſhed; but he little imagined that his compoſition would be admired, and his prince celebrated in a language not then formed, and by the natives of regions ſo remote from his own.

In the *tenth* leaf of the *Ta Hio*, a beautiful compariſon is quoted from another ode in the *Shi King*, which deſerves to be exhibited in the ſame form with the preceding:

1 2 3
' The peach-tree how fair! how graceful!
4 5 6 7
' Its leaves, how blooming! how pleaſant!
8 9 10 11
' Such is a bride, when ſhe enters her bridegroom's houſe,
12 13 14 15
' And pays due attention to her whole family.'

The ſimile may thus be rendered:

Gay child of Spring, the garden's queen,
  Yon peach-tree charms the roving ſight:
Its fragrant leaves how richly green!
  Its bloſſoms how divinely bright!

So ſoftly ſmiles the blooming bride,
  By Love and conſcious Virtue led
O'er her new manſion to preſide,
  And placid joys around her ſpread.

The next leaf exhibits a compariſon of a different nature, rather ſublime than agreeable, and conveying rather cenſure than praiſe:

1 2 3 4
O how horridly impends yon ſouthern mountain!
5 6 7 8
Its rocks in how vaſt, how rude a heap!
9 10 11 12
Thus loſtily thou ſitteſt, O miniſter of YN!
14 13 15 16
All the people look up to thee with dread.

Which may be thus paraphraſed:

See, where yon crag's imperious height
  The ſunny highland crowns,
And hideous as the brow of night,
  Above the torrent frowns!

So ſcowls the Chief, whoſe will is law,
  Regardleſs of our ſtate;
While millions gaze with painful awe,
  With fear allied to hate.

It was a very ancient practice in *China* to paint or engrave moral ſentences and approved verſes on veſſels in conſtant uſe; as the words *Renew thyſelf daily* were inſcribed on the baſon of the emperor *Tang*, and the poem of *Kien Long*, who is now on the throne, in praiſe of tea, has been publiſhed on a ſet of porcelain cups; and if the deſcription juſt cited of a ſelfiſh and inſolent ſtateſman were, in the ſame manner, conſtantly preſented to the eyes and attention of rulers, it might produce ſome benefit to their ſubjects and to themſelves; eſpecially if the comment of *Tſem Tſu*, who may be called the *Xenophon* as *Cun Fu Tſu* was the *Socrates*, and *Mem Tſu* the *Plato*, of *China*, were added to illuſtrate and enforce it.

If the reſt of the *three hundred* Odes be ſimilar to the ſpecimens adduced by thoſe great moraliſts in their works, which the *French* have made public, I ſhould be very ſolicitous to procure our nation the honour of bringing to light the *ſecond* claſſical book of the *Chineſe*. The *third*, called *Yeking*, or the book of changes, believed to have been written by *Fo* the *Hermes* of the Eaſt, and conſiſting of right lines variouſly diſpoſed, is hardly intelligible to the moſt learned *Mandarins*; and *Cun Fu Tſu* himſelf, who was prevented by death from accompliſhing his deſign of elucidating it, was diſſatisfied with all the interpretations of the earlieſt commentators. As to the *fifth*, or *Liki* which that excellent man compiled from old monuments, it conſiſts chiefly of the *Chineſe* ritual, and of tracts on moral duties; bnt the *fourth* entitled *Chung Cieu*, or *Spring* and *Autumn*, by which the ſame incomparable writer meaned the *flouriſhing* ſtate of an empire under a virtuous monarch, and the *fall* of kingdoms under bad governors, muſt be an intereſting work in every nation. The powers, how-

ever, of an individual are ſo limited, and the field of knowledge is ſo vaſt, that I dare not promiſe more than to procure, if any exertions of mine will avail, a complete tranſlation of the *Shi King*, together with an authentic abridgement of the *Chineſe* laws, civil and criminal. A native of *Canton*, whom I knew ſome years ago in *England*, and who paſſed his firſt examinations with credit in his way to literary diſtinctions, but was afterwards allured from the purſuit of learning by a proſpect of ſucceſs in trade, has favoured me with the *Three Hundred Odes* in the original, together with the *Lun Yu*, a faithful verſion of which was publiſhed at *Paris* near a century ago; but he ſeems to think, that it would require three or four years to complete a tranſlation of them; and Mr. Cox informs me that none of the *Chineſe* to whom he has acceſs, *poſſeſs leiſure and perſeverance enough for ſuch a taſk*; yet he hopes, with the aſſiſtance of *Whang Atong*, to ſend me next ſeaſon ſome of the poems tranſlated into *Engliſh*. A little encouragement would induce this young *Chineſe* to viſit *India*, and ſome of his countrymen would, perhaps, accompany him; but though conſiderable advantage to the public, as well as to letters, might be reaped from the knowledge and ingenuity of ſuch emigrants, yet we muſt wait for a time of greater national wealth and proſperity, before ſuch a meaſure can be formally recommended by us to our patrons at the helm of government.

XIV.

A TABLE,

Containing Examples *of all the different species of* Infinitives *and* Participles *that are derived from* Triliteral Verbs, *in the form in which they are used in the* Persian, *and in the Language of* Hindostan.

ARABIC TRILITERAL VERBS.

Class	Form	Conjugation 1st.	From	2d.	From	3d.	From	4th.	From
I. With three different radicals, none of them, as نعل — اري	Infin.	نَعْل action,	نعل	تَقْصِير fault,	قصر	مُخَالَفَت opposition,	خلف	اظْهَار demonstration,	ظهر
	Part. act.	حَاكِم judging,	حكم	مُصَدِّع importuning,	صدع	مُطَابِق conforming,	طبق	مُهْلِك destroying,	هلك
	Part. pas.	مَقْتُول slain,	قتل	مُكَسَّر broken,	كسر	مُنَاسِب connected,	نسب	مُطْلَق absolved,	طلق
II. With the 2d and 3d radicals the same, but none of them, as عزّ — اري	Infin.	عِزّ honor,	عزّ	تَكْرِير repetition,	كرّ	مُمَادَّت extension,	مدّ	اِقْرَار confirmation,	قرّ
	Part. act.	حَاجّ performing the pilgrimage,	حجّ	مُحَقِّق certifying,	حقّ	مُمَادّ extending,	مدّ	مُعِزّ honoring,	عزّ
	Part. pas.	مَذْمُوم blamed,	ذمّ	مُكَرَّر repeated,	كرّ	مُضَادّ opposed,	مدّ	مُعَدّ prepared,	عدّ
III. With ا for the 1st radical, as ادب	Infin.	اَدَب civility,	ادب	تَأْدِيب instruction,	ادب	مُوَاخَرَت procrastination,	اخر	اِيثَار presentment,	اثر
	Part. act.	آكِل eating,	اكل	مُؤَصِّل establishing,	اصل	مُوَارِف lying contiguous,	ارف	مُؤَكِّل giving to eat,	اكل
	Part. Pas.	مَأْخُوذ taken,	اخذ	مُؤَدَّب well educated,	ادب	مُؤَانَس familiarized,	انس	مُؤْلَم pained,	الم
IV. With ا for the 2d radical, as شان	Infin.	شَأْن condition,	شان	تَلْئِيم mitigation,	لام	مُلَاءَمَت complacency,	لام	اِسَالَت compliance,	سال
	Part. act.	سَائِل interrogating,	سال						
	Part. pas.	مَسْؤُول sought,	سال	مُلَأَّم clothed in mail	لام			مُمْلَا filled,	ملا
V. With ا for the 3d radical, as برا	Infin.	بَرَاء relief, cure,	برأ	تَهْنِيَت congratulation,	هنا			اِبْرَاء relief,	برا
	Part. act.	بَارِي creating,	برأ	مُبَرِّي free,	براء			مُبْنِي causing to build,	بنا
	Part. pas.	مَبْرِي freed,	برأ	مُهَنَّا congratulated,	هنا			مُنْشَا erected,	نشا
VI. With و for the 1st radical, as وضع	Infin.	وَضْع situation,	وضع	تَوْفِيق concurrence,	وفق	مُوَاظَبَت perseverance,	وظب	اِيجَاب necessity,	رجب
	Part. act.	وَاصِل arriving,	وصل	مُؤَكِّد confirming,	وكد	مُوَافِق agreeing,	وفق	مُوجِب causing,	وجب
	Part. pas.	مَوْضُوع placed,	وضع	مُوَفَّق assisted	وفق			مُوجَد confirmed,	وجد
VII. With و for the 2d radical, as قول	Infin.	قَوْل speech,	قول	تَطْوِيل prolixity,	طول	مُدَاوَمَت continuation,	دوم	اِجَازَت permission,	جوز
	Part. act.	قَائِل speaking,	قول	مُنَوِّر illuminating,	نور	مُقَاوِم rising against another,	قوم	مُقِيم continuing,	قوم
	Part. pas.	مَخُوف dreaded,	خوف	مُطَوَّل extended,	طول			مُجَاز permitted,	جوز
VIII. With و for the 3d radical, as سهو	Infin.	سَهْو omission,	سهو	تَرْبِيَت education,	ربو	مُلَاقَات interview,	لقو	اِنْشَا composition,	نشو
	Part. act.	عَادِي transgressing,	عدو	مُرَبِّي instructing,	ربو	مُلَاقِي meeting,	لقو	مُنْشِي a Moonshy, a composer, composing,	نشو
	Part. pas.	مَدْعُو & مدعي solicited,	دعو	مُرَبَّي instructed,	ربو			مُلْقَا thrown,	لقو
IX. With ي for the 1st radical, as يقن	Infin.	يَقِين certainly,	يقن	تَيْسِير the act of facilitating,	يسر	مُيَامَنَت the act of blessing,	يمن	اِيقَان certain knowledge,	يقن
	Part. act.	يَامِن prospering,	يمن	مُيَمِّن enjoying prosperity,	يمن			مُوقِن certain,	يقن
	Part. pas.	مَيْمُون favoured by fortune,	يمن	مُيَسَّر obtained,	يسر				
X. With ي for the 2d radical, as سير	Infin.	سَيْر the act of walking out,	سير	تَغْيِير alteration,	غير	مُغَايَرَت the act of changing,	غير	اِضَافَت relation,	ضيف
	Part. act.	مَائِل inclining,	ميل	مُخَيِّر choosing,	خير	مُغَايِر opposing,	غير	مُخَيِّم pitching a tent,	خيم
	Part. pas.	مَبِيع sold,	بيع	مُغَيَّر changed,	غير			مُضَاف annexed,	ضيف
XI. With ي for the 3d radical, as بغي	Infin.	بَغْي injustice,	بغي	تَثْنِيَه the act of doubling,	ثني	مُكَافَات compensation,	كفي	اِنْهَا the act of announcing,	نهي
	Part. act.	قَاضِي judging,	قضي	مُصَلِّي praying,	صلي	مُنَافِي repugnant,	نفي	مُنْهِي reporting,	نهي
	Part. pas.	مَقْضِي determined,	قضي	مُثَنَّا doubled,	ثني			مُغْشَا covered over,	غشي
XII. With ا for the 1st, and و the 2d radical, as اوب	Infin.	اَوْب attract,	اوب	تَأْوِيل explication,	اول				
	Part. act.	آئِب troublesome,	اوب	مُؤَوِّل explaining,	اول				
	Part. pas.	مَأْوُوف hurt,	اوف	مُؤَوَّل translated,	اول			مَوْؤُود weighed down,	اود

A TABLE containing EXAMPLES, &c.

5th. From			6th. From			7th. From			8th. From			10th. From		
تكبّر	arrogance,	كبر	تغافل	negligence,	غفل	انكسار	contrition,	كسر	انتظام	regulation,	نظم	استقبال	a meeting,	قبل
متصرّف	possessing,	صرف	متعاقب	succeeding another,	عقب	مندرج	comprehending & comprehended,	درج	منتظر	expecting,	نظر	مستحفظ	protecting,	حفظ
متعلّق	annexed,	علق	متباعد	removed,	بعد				منتظم	regulated,	نظم	مستحكم	confirmed,	حكم
تجسّس	investigation,	جسّ	تداقق	mutual search,	دقّ	انحلال	solution,	حلّ	اهتمام	solicitude,	همّ	استقلال	independency,	قلّ
متردّد	opposing,	ردّ	تحاجّ	disputation,	حجّ	منهلّ	flowing profusely,	هلّ	مشتدّ	wearing out,	شدّ	مستقلّ	absolute,	قلّ
متضرّر	injured,	ضرّ	متراد	opposing each other,	ردّ				مختلّ	depraved,	خلّ	مستمرّ	past,	مرّ
تأمّل	deliberation,	امل	متماسّ	touched,	مسّ				ائتمان	confidence,	امن	استيصال	extirpation,	اصل
متأخّر	retarding,	اخر							مؤتمن	confiding,	امن	مستأدب	studying civility,	ادب
		فال							مؤتمن	confided,	امن	مستأصل	eradicated,	اصل
									افتيال	auguration,	فال			
تسئّل	the act of begging,	سال	تساءل	expostulation,	سال									
متسوّل or متسائل	begging,	سال	متسائل	begging,	سال									
			متفائل	portended,	فال									
تهنو	refreshing with good food,	هنا							ابتداء	commencement,	بدأ	استبراء	purification,	براء
متبري	freeing,	برا	متباهي	boasting mutually,	بها				مبتدي	beginning,	بدأ	مستبري	desiring to be free,	براء
متهنّا	congratulated,	هنا							مبتدا	begun,	بدأ			
توقّف	delay,	وقف	تواضع	submission,	وضع				اتّحاد	union,	وحد	استيطان	residence,	وطن
متوجّه	giving countenance,	وجه	متواتر	succeeding another,	وتر				متّصل	approaching,	وصل	مستوطن	residing,	وطن
متوقّع	expected,	وقع	متواصل	united,	وصل				متّحد	united,	وحد	مستودع	deposited,	ودع
تصوّر	the act of imagining,	صور	تجاوز	excess,	جوز	انقياد	submission,	قود	اشتياق	affection,	شوق	استصواب	approbation,	صوب
متصوّر	imagining,	صور	متجاوز	exceeding,	جوز	منقاد	obeying,	قود	مشتاق	desiring,	شوق	مستطيل	exalting himself,	طول
متصوّر	imagined,	صور	متعاور	received in loan,	عور				مشتاق	desired,	شوق	مستعار	received in loan,	عور
تعدّي	violence,	عدو	تلافي	prosecution,	لفو	انجلا	brightness,	جلو	التقا	conference,	لقو	استدعا	the act of petitioning,	عود
متعدّي	trangressing,	عدو	متعالي	raising on high,	علو	متعدّي	contagious,	عدو	ملتقي	coming to meet,	لقو	مستدعي	desiring aid to oppose,	دعو
متلقّا	met,	لقو							مبتلا	afflicted,	بلو	مستدعا	solicited,	دعو
تيمّن	the act of making happy,	يمن	تباجر	the act of revolting,	بجر				ايقان	the act of ascertaining,	يقن	استيسار	the act of facilitating,	يسر
متيقّن	ascertaining,	يقن	متباجر	revolting,	بجر							مستيقن	exploring,	يقن
متيقّظ	roused,	يقظ	متباجر	revolted,	بجر									
تقيّد	application,	قيد	تمايل	inflexion,	ميل	انقياد	submission,	(قيد?)	اختيار	option,	خير	استمالت	the act of soothing,	ميل
متحيّر	wondering,	حير	متغاير	altering,	غير	منقاد	obeying,	(قيد?)	مختار	choosing,	خير	مستفيد	acquiring gain,	فيد
متعيّن	appointed,	عين							مختار	chosen,	خير	مستزاد	increased,	زيد
تعصّي	rebellion,	عصى	تعالي	exaltation,	علي	انقضا	expiration of time,	قضي	اكتفا	sufficiency,	كفي	استقضا	appeal for judgement,	قضي
متمنّي	wishing,	مني	متناهي	completing,	نهي	منقضي	coming to a conclusion,	قضي	مقتضي	requiring,	قضي	مستغني	enjoying plenty,	غني
متمنّا	wished,	مني							مقتضا	required,	قضي	مستثنا	excepted,	ثني
تأوّل	exposition,	اول												
متأوّل	interpreting,	اول							موتاب	returning,	اوب	مستاور	taking fright,	اور
متاوّل	translated,	اول							موتاب	returned,	اوب	مستاور	affrighted,	اور

A TABLE CONTAINING EXAMPLES, &c.

5th.	From	6th.	From	7th.	From	8th.	From	10th.	From
تَأَيُّدْ confirmation,	ايد								
مُتَأَيِّدْ confirming,	ايد								
مُتَأَيَّسْ made ſoft,	ايس								
تَهَيُّؤ preparation,	هيء								
مُتَهَيِّئ preparing,	هيء								
مُتَهَيَّأ prepared,	هيء								
تَأَخِّي behaviour of a brother,	اخو	تَآخِي mutual fraternity,	اخو						
مُتَأَخِّي acting like a brother,	اخو	مُتَآخِي behaving mutually like brothers,	اخو			مُوتَسِي imitating,	اسو		
تَأَنِّي caution,	اني							مُسْتَأْنِي waiting with patience,	اني
مُتَأَنِّي cautious,	اني								
		مُتَرَائِي looking at one another,	راي						
تَوَفِّي the act of fulfilling,	وفي	تَوَالِي a ſeries of ſucceſſion,	ولي			اِتِّقَا abſtinence,	وقي	اِسْتِيفَا the act of fulfilling,	وفي
مُتَوَفِّي giving up life,	وفي	مُتَوَالِي following in ſucceſſion,	ولي			مُتَّقِي abſtinent,	وقي	مُسْتَوْفِي fulfilling,	وفي
مُتَوَفَّا deceaſed,	وفي								
تَقَوِّي ſuperior ſtrength	قوي	تَقَاوِي the act of impowering,	قوي			اِسْتِوَا equality,	سوي		
مُتَقَوِّي having great ſtrength,	قوي	مُتَقَاوِي impowering,	قوي			مُسْتَوِي equal,	سوي		
								اِسْتِحْيَا modeſty,	حيي
مُتَأَوِّي collecting together,	اوي					مُوتَوِي receiving into his houſe,	اوي		

No.	Description	Root	Form	Conjugation 1st	From	2d	From	3d	From	4th	From
XIII.	With ا for the 1st, and ي the 2d radical, as	ايد	Infin.	أَيْدٌ strength,	ايد	تَأْيِيدٌ confirmation,	ايد				
			Part. act.	آيِدٌ potent,	ايد	مُؤَيِّدٌ confirming,	ايد			مُؤْيِدٌ confirming,	ايد
			Part. paf.	مَأْيُوسٌ made desperate,	ايس	مُؤَيَّدٌ confirmed,	ايد			مُؤْيَدٌ confirmed,	ايد
XIV.	With ا the 3d, and و the 2d radical, as	سوء	Infin.	سُوءٌ depravity,	سوء	تَسْوِيَةٌ accusation,	سوء	مُسَاءَتٌ evil,	سوء	إِسَاءَتٌ evil doing,	سوء
			Part. act.							مُسِيءٌ finning,	سوء
			Part. paf.								
XV.	With ا the 3d, and ي the 2d radical, as	جيء	Infin.	هَيٌّ the act of calling to eat and drink,	هيء	تَهْيِئَةٌ preparation,	هيء				
			Part. act.	جَائِي coming,	جيء	مُهَيِّئٌ preparing,	هيء				
			Part. paf.			مُهَيَّأً prepared,	هيء				
XVI.	With ا the 1st, and و the 2d radical,	اخو	Infin.	أَسْوٌ medicine,	اسو	تَأْبِيَةٌ the act of calling "father,"	ابو	مُوَاخَاتٌ the cultivation of friendship,	اخو		
			Part. act.	آسِي curing,	اسو	مُؤَسِّي giving comfort,	اسو			مُؤْسِي giving comfort,	اسو
			Part. paf.	مَأْسُوٌ cured,	اسو						
XVII.	With ا the 1st, and ي the 3d radical,	اني	Infin.	أَذْيٌ trouble,	اذي	تَأْدِيَةٌ performance,	ادي	مُوَازَاتٌ parallelism,	ازي	إِيذَاءٌ molestation,	اذي
			Part. act.	آذِي taking trouble,	اذي	مُؤَدِّي performing,	ادي	مُوَازِي parallel,	ازي	مُؤْذِي molesting,	اذي
			Part. paf.			مُؤَدًّا performed,	ادي				
XVIII.	With ا the 2d, and ي the 2d radical, as	راي	Infin.	رَأْيٌ observation,	راي			مُرَايَاتٌ dissimulation,	راي	إِرَاءَتٌ the act of shewing,	راي
			Part. act.	رَائِي observing,	راي			مُرَائِي dissembling,	راي		
			Part. paf.	مَرْئِيٌّ observed,	راي						
XIX.	With و the 1st, and ي the 2d radical,	وقي	Infin.	وَقْيٌ protection,	وقي	تَوْقِيَةٌ the act of protecting,	وقي	مُوَافَاتٌ the performance of what is due,	وفي	إِيفَاءٌ the performance of what is stipulated,	وفي
			Part. act.	وَاقِي protecting,	وقي	مُوَقِّي powerful,	وقي	مُوَافِي performing,	وفي	مُوصِي making a will,	وصي
			Part. paf.	مَوْقِيٌّ protected,	وقي	مُوَصًّا directed by a will,	وصي			مُوفًا performed,	وفي
XX.	With ي the 1st, and ي the 3d radical,	يدي	Infin.	يَدْيٌ power,	يدي			مُيَادَاتٌ payment out of one's own hand,	يدي		
			Part. act.							مُوْدِي beneficent,	يدي
			Part. paf.	مَيْدِيٌّ hurt in the hand,	يدي					مُوْدًا benefited,	يدي
XXI.	With و the 2d, and ي the 3d radical,	توي	Infin.	قُوَّتٌ strength,	قوي	تَقْوِيَتٌ corroboration,	قوي	مُسَاوَاتٌ the act of making equal,	سوي		
			Part. act.	قَاوِي seizing,	قوي	مُقَوِّي strengthening,	قوي	مُسَاوِي equal,	سوي	مُقْوِدِي having strong cattle,	قوي
			Part. paf.	مَرْوِيٌّ narrated,	روي	مُقَوًّا strengthened,	قوي				
XXII.	With ي the 2d and ي the 3d radical, as	حيي	Infin.	حَيَاتٌ life,	حيي	تَحِيَّتٌ salutation,	حيي			إِحْيَاءٌ vivification,	حيي
			Part. act.	حَائِي living,	حيي	مُحَيِّي saluting,	حيي			مُحْيِي vivifying,	حيي
			Part. paf.								
XXIII.	With و for the 1st, and ي the 2d radical,	اوي	Infin.	أَوْيٌ vid. gol.							
			Part. act.	آوِي vid. gol.							
			Part. paf.								
XXIV.	With و the 1st, and ي the 3d radical,	واي	Infin.	وَأْيٌ promise,	واي						
			Part. act.								
			Part. paf.								

A Letter to the PRESIDENT *from a young* CHINESE.

SIR,

I RECEIVED the favour of your letter dated 28th March, 1784, by Mr. *Cox*. I remember the pleasures of dining with you in company with Captain *Blake* and Sir *Joshua Reynolds*; and I shall always remember the kindness of my friends in *England*.

The *Chinese* book, *Shi King*, that contains three hundred poems, with remarks thereon, and the work of *Con fu-tsu*, and his grandson, the *Tai Ho*, I beg you will accept: but to translate the work into *English* will require a great deal of time, perhaps three or four years; and I am so much engaged in business, that I hope you will excuse my not undertaking it.

If you wish for any books or other things from *Canton*, be so good as to let me know, and I will take particular care to obey your orders.

Wishing you health,

I am, SIR,

Your most obedient humble Servant,

WHANG ATONG.

To Sir WILLIAM JONES,
Dec. 10, 1784.

ADVERTISEMENT.

EXAMPLES of derivatives from Arabic quadriliterals rarely occur in the Persian language; and from the 9th, 11th, 12th, and 13th, conjugations of triliterals there are none to be met with, I have, therefore, confined my observations to the nine conjugations included in the table. And although particular senses and uses are assigned to each of these by grammarians, (which may be seen in Mr. *Richardson's* Gram. p. 65) it is at the same time to be observed, that they are nevertheless frequently used in other senses; many of them retaining the simple signification of their primitives: and that every root does not extend through every conjugation, but that some are used in one form, many in several, none in all.

These observations are applicable to the present subject; and the derivatives of such conjugations as are more frequently used in the Arabic, seem also to be more frequently than any other introduced into the Persian.

Where no examples of any particular form is to be found in Golius and Meninski, I have left a blank in the table, which may be filled up whenever any can be met with.

With regard to the examples which I have brought to illustrate the following rules, they are such as came first to hand; and *one* example of an infinitive or participle is intended as a representation of the infinitives and participles of every species and conjugation. To have attempted a complete system of

examples would have carried me far beyond the limits of my preſent undertaking.

OF ARABIC INFINITIVES.

I. Their Máſculine Singulars are uſed in the Perſian as Subſtantives; and in every reſpect ſerve the ſame purpoſes, and are ſubject to the ſame rules of conſtruction as ſubſtantives originally Perſian.

Ex.

1. governing a sub. fol.	اظهار یکانکی	demonstrations of unanimity
2. agreeing with an ad. fol.	استعجال تمام	great haste
3. agreeing with a part. pas. fol.	تحریر مسطور	the said writing
4. nominatives to verbs,	نظر براین بود	my view was this
5. governed by verbs,	احتظاظ وافر یافت	he received great delight
6. governed by a prep.	بعد از تقدیم مراسم	after performing the duties
7. united by a conjunction	اقبال و اجلال	prosperity and splendour
8. rendered definite by affixing ی	اتحادی که درمیان بود	the union that was between

II. Their Maſculine plurals are uſed in the Perſian as ſubſtantives; and in every reſpect ſerve the ſame purpoſes, and are ſubject to the ſame rules of conſtruction as ſubſtantives originally Perſian.

Ex.

1. governing a sub. fol.	اخلاق مردم	the dispositions of men.

Ex.

2. agreeing with an ad. fol. افعالِ نیک good actions

3. agreeing with a part. pas. fol. اطوار مسطور the qualifications described

III. Their Feminine Singulars are uſed in the Perſian as ſubſtantives; and in every reſpect ſerve the ſame purpoſes, and are ſubject to the ſame rules of conſtruction as ſubſtantives originally Perſian.

Ex.

1. nominatives to verbs, اجازت است there is permission

2. governing a sub. fol. معاملت ملک the business of the empire.

3. agreeing with an ad. fol. مقاتلهٔ عظیمه a bloody battle

4. agreeing with a part. pas. fol. مکاتبهٔ مرقومه بدوستی a letter written in friendship.

IV. Their Feminine Plurals are uſed in the Perſian as ſubſtantives; and in every reſpect ſerve the ſame purpoſes, and are ſubject to the ſame rules of conſtruction as ſubſtantives originally Perſian.

Ex.

1. governing a sub. fol. توجهاتِ دوستان the civilities of friends

2. agreeing with an ad. fol. معاملاتِ کلّی public affairs

3. agreeing with a part. pas. fol. تکلیفاتِ مزبور the said burthens

V. The infinitives of the firſt conjugation of tranſitive verbs are regularly of the form exhibited in the table. But thoſe of Intranſitives are reducible to no

proper rule without innumerable exceptions. Grammarians make of them in all thirty-two different forms, which may be seen in Mr. Richardson's Grammar, p. 92. but for these irregularities, he justly observes, that a dictionary is the only proper guide. These Infinitives, both Singulars and Plurals, are introduced freely into the Persian as Substantives.

Ex. governing another sub. fol.	وصولِ مکتوب	the arrival of the letter & ca & ca

OF ARABIC PARTICIPLES ACTIVE.

I. Their Masculine Singulars are used in the Persian as participles, as substantives, and as adjectives.

Ex.		
1. as participles with a verb fol.	منتظر ماند	he remained expecting
	طالع و لامع بان	be shining and blazing
2. as sub. governing another sub. fol.	حاکمِ شهر	governor of the city
	موجب خوشنودی	causing gladness —the cause of gladness
	مصنفِ ابن کناب	composing this book—the author of this book
	مطاتقِ شرعِ شریف	following the noble law—follower of the noble law
3. as an ad. qualifying a sub.	مردمِ تابل.	an able man
4. following another sub. signifying the same thing	حضرت خالق	God the creator

Ex.

5. agreeing with an ad. fol,	عاملِ نیک	a good agent
6. agreeing with a part. pas. fol.	حاکم مستقّل	absolute judge
7. governed by a verb,	قاتلرا کشت	he put the murderer to death
8. nominatives to verbs,	اگر عاشقِ صادق است	if the lover be sincere
9. with a prep. fol. an uncommon construction.	مشتمل بر مصادقت	containing friendship.

II. Their masculine perfect plurals are used in the Persian as substantives, in the form of the oblique case which terminates in ين. But they do not seem to be used in the form of the nominative which terminates in ون

Ex. 1. governed by a sub. going before,	علمِ اوّلین وآخرین	the knowledge of the moderns and ancients.
	قومِ مسلمین	the sect of the faithful

III. Their masculine imperfect plurals are used in the Persian as substantives.

Ex.

1. governing a sub. fol,	حکّامِ حال و استقبال	officers of the present and future
2. agreeing with an ad. fol.	عمالِ جدید و قدیم	the new and old agents

IV. Their feminine singulars are used in the Persian as participles, as substantives, and as adjectives.

Ex.

1. as a part. act. with a verb. fol.	حامله است	she is pregnant
sub. governing another fol.	مالکهٔ ملک	queen of the empire

Ex.

3. as an. ad. qualifying a sub. going before, زنِ حامله a pregnant woman

4. as a sub. qualified by an. ad. following, مشفقۀ مهربان kind friend

5. as a sub. qualified by a part. pas. following, صاحبۀ موصوفه accomplished lady

V. Their feminine perfect plurals are used in the Persian as substantives expressing things without life.

Ex.

1. governing a sub. following, واقعاتِ زمان the incidents of time

2. aggreeing with an ad. fol. وارداتِ ناگهانی unforseen events

OF ARABIC PARTICIPLES PASSIVE.

I. Their masculine singular are used in the Persian as participles passive, as substantives, and as adjectives.

Ex.

1. as part. pas. جملگی همت مصروف بران است the sum of my desire is bestowed on that

ظلِ شفقت ممدود باد be the shade of clemency extended

2. as a sub. governing another following it مشهود ضمیر منیر میگرداند I make it the perception (i. e. the thing perceived) of your enlightened soul; i. e. I represent it, &c.

	مرغوب طبايع	the desire, (i. e. the thing desired) of the souls
3. as an ad. qualifying a sub. going before,	بندهٔ مظلوم	the injured slave
4. joined with another sub. by a con.	مقصود و مرام	intention and design
5. governed by verbs,	خلايق را محظوظ کردانند	make the people glad
6. nominatives to verbs,	مقصودِ اوشان بر اين بود	their intention was this

II. Their masculine perfect plural does not seem to be used in the Persian, either in the form of the nominative or the oblique case.

III. Their feminine singulars are used in the Persian as substantives, and as adjectives.

Ex.

1. as a sub. governing another fol. it,	معشوقهٔ من	my beloved, i. e. the beloved of me
2. as a sub. agreeing with a part. pas. fol.	معشوقهٔ مذکوره	the said beloved woman
3. as an ad. agreeing with a sub. going before,	والدهٔ مخدومه	respected mother

IV. Their feminine perfect plurals are used in the Persian as substantives, to express things without life.

Ex.

1. governing a sub. fol.	مطلوبات آن مهربان	the demands of that friend
2. agreeing with an ad. fol.	مقدماتِ شرعي	law affairs

P 2

V. The active and passive participles of transitive verbs form, with a following substantive having the article ال prefixed to it, compounds corresponding to that of خوبروی, which are used in the Persian as substantives and as adjectives.

Ex.

1. as a sub. a nominative to the verb,	متعذّر الفصل است	he evades a decision
2. as an ad. qualifying a sub.	شخصِ واجبُ التعظیم	a person deserving respect
	قلم مقطوع اللسان	a pen cut short in the point

OF ARABIC ADJECTIVES *resembling* PARTICIPLES.

I. The forms حَسَن صَعْب سَرِير represent three species of Arabic words which are derived from intransitive verbs; and called by Arabic grammarians, adjectives resembling participles. The singulars of these forms are used in the Persian both as adjectives and substantives.

Ex.

1. as a sub. qualified the pronoun dem.	آن عزیز	that respectable person
2 with a verb,	شریر است	he is wicked
3. as an ad. qualifying a sub.	دوست قدیم	an old friend

II. Their plurals are used in the Persian as substantives.

Ex.

1. governing a sub.ᵉ fol.	حکماي یونان	the learned men of Greece
2. agreeing with an ad. fol.	شرفاي پاک نهاد	noblemen of integrity

III. Theſe three forms of adjectives, reſembling participles, form, with a following ſubſtantive having the article ال prefixed to it, compounds correſponding to that of خوب روی, which are uſed in the Perſian both as ſubſtantives and adjectives.

Ex.

1. as a sub. qualified by the pro. demon.	آن حسن الوجه	that beauty
	آن قديم الخدمت	that old se[illegible]
2. as a sub. qualified by an ad. fol.	قديم الخدمت مذكور	the said old servant
3. as an ad. qualifying a sub. going before,	مرد قديم الخدمت	a man of long service.

OF PARTICIPLES *expreſſing the Senſe of their* PRIMITIVES *in a ſtronger Degree.*

I. The forms نَصِيرٌ نَصَّارٌ نَصُورٌ نَصِرٌ مِنْصَارٌ are participles which expreſs the ſenſe of their primitives in a ſtronger degree; and are ſometimes uſed in the Perſian as adjectives.

Ex. 1. agreeing with a sub. going before,	ادويه قتاله	a poiſonous medicine
2. agreeing with a verb. fol.	صبور است	he is full of patience.

ضريب is the form of a participle expreſſing the ſenſe of the primitive in a leſs degree; but it does not ſeem to be uſed in the Perſian.

OF ARABIC SUBSTANTIVES.

I. The Arabic noun of time and place are frequently employed in the Perſian; and the following liſt exhibits the forms of ſuch as are derived from the firſt conjugations of the different ſpecies of triliterals.

CONJUGATION FIRST.

NOUNS *of* TIME *and* PLACE *form* TRILITERALS.

		From	Roots
I.	مَكْتَبٌ	the time and place of writing,	كتب
II.	مَقَرٌّ	a place of rest—residence,	قر
III.	مَأْمَنٌ	a place of safety,	امن
V.	مَبْدَأ	the place and time of beginning,	بدء
VI.	مَوْضِعٌ	place—opportunity,	وضع
VII.	مَقَام	the place and time of standing,	قوم
VIII.	مَدْعَا	the place or object of desire,	دعو
X.	مَبِيعٌ	the place and time of selling,	بيع
XI.	مَرْمَا	the place and time of throwing,	رمي
XII.	مَآبٌ	the place of return—the center,	اوب
XV.	مَجِيء	the time of coming—arrival,	جي
XVII.	مَأْتَا	the place, the way of approaching,	اتي
XVIII.	مَرْءَا	the place of looking, beholding,	راي
XIX.	مَوْلًا و مَوْلَى	the place of power—and thus lord, master, &c.	ولى
XXI.	مَهْوَا	a place of division—the interval,	هوي
XXII.	مَحْيَا	the time and place of living,	حي
XXIII.	مَأْوَا او مَاوِي	a place of habitation—refuge,	اوي

———To express the *place* more particularly, ت is sometime added to the common form, as, مقبره burning place.

II. The noun of time and place from the derivative conjugations is exactly the same with the participle passive; and is also used in the Persian.

Ex. 1. a part. pas. from the 10th con. مستودع deposited—also a place of deposit

III. The Persian language has terms proper to itself for expressing the instrument of action; it does not however reject the use of the Arabic instrumental noun which is represented by the forms, مِنْصَار مِنْصَر or مِنْصَرَة

Ex. 1. governing another بميزان عقل سنجيد he weighed in scale of reason
مفتاح مقصود the key of intention

IV. All Arabic proper names, and the names of things, are introduced into Persian at pleasure.

Ex. مريم Mary, مكّه Mecca, عين the eye, لحم flesh, جدّ an ancestor, &c. &c.

OF ARABIC ADJECTIVES.

I. Besides the Arabic participles which we have already observed are used as adjectives, there is also a plentiful source of real adjectives formed by affixing ى to substantives of almost every denomination, which are freely introduced into the Persian.

Ex. انسانی humane, اراضي earthly, مصري Egyptian, &c. &c.

II. The maſculine ſingulars of Arabic ſuperlatives are uſed in the Perſian both as ſubſtantives and adjectives.

Ex.

1. as a sub. governing another fol. it	اسعد زمان	the most fortunate of times
2. as an ad. qualifying a sub. going before,	در وقت احسن	at a moſt lucky time

III. The maſculine plurals of Arabic ſuperlatives are uſed in the Perſian both as ſubſtantives and adjectives.

Ex.

1. as a sub. governing another fol. it,	اکابرِ وقت	the great men of the age
2. as an ad. qualifying a sub. going before,	اشخاصِ اکابر	most illustrious personages

IV. The feminine ſingulars of Arabic ſuperlatives are uſed in the Perſian as adjectives.

Ex. 1. qualifying a sub. going before,	دولتِ عظمی	prosperity most great

V. Arabic ordinal numbers are uſed in the Perſian as adjectives.

x. . qualifying a sub. before,	بابِ اول	the first chapter

Of the FORM *of* ARABIC WORDS *when used in the* PERSIAN.

I. All Arabic infinitives, participles, ſubſtantives, and adjectives, are introduced into the Perſian in the form of the nominative, which throws away from the laſt letter every ſpecies of nunnation (ً ٍ ٌ) ; or ſhort vowel (َ ِ ُ), which they may poſſeſs as Arabic words, and remain without motion ; but when their conſtruction in the Perſian requires them to aſſume the termination of another caſe, they receive it in the ſame manner as if they were originally Perſian words ; with the following exceptions.

1ſt. When an Arabic word terminating in ى, that muſt be pronounced as ا *, becomes the firſt ſubſtantive in conſtruction with another ſubſtantive following it, ى is actually changed into ا, to which ſhort ى (ِ) is afterwards affixed to ſhew the conſrtuction.

Ex. تمنى in conſtruction becomes تمناى, as تمناى شفاعت the petition of interceſſion, and ſo alſo معنى دعوى مولى &c.

2*d*. Feminine Arabic *ſubſtantives* terminating in ة when introduced into the Perſian, change ة, ſometimes into ة, and ſometimes into ت.

Ex. محبت friendſhip, being found written by the ſame author محبة and محبت.

3*d*. Feminine Arabic *adjectives* and *participles* terminating in ة, when introduced into the Perſian, always change ة into ه.

* See Richardſon's Arabic Gram. p. 109. Canon. III.

Ex. خالصة pure, is always written خالصه as محبت خالصه pure friendſhip.

4*th*. Arabic particles plural terminating in ين, although introduced into the Perſian as nominatives, are originally the oblique caſes.

Ex. دانایان متقدمین چنین فرمودند the learned ancients thus ſaid.

5*th*. When an Arabic infinitive is uſed in the Perſian language as an adverb, it is introduced in the form of the Arabic accuſative without any change.

Ex. اتفاقا accidentally, &c. &c.

OF ARABIC ADVERBS, PREPOSITIONS, AND CONJUNCTIONS.

I. Arabic adverbs, prepoſitions, and conjunctions, ſeem to be introduced into the Perſian language at pleaſure. Of theſe Mr. Richardſon has made a very uſeful collection in his chapter of ſeparate particles, to which I beg leave to refer; obſerving, at the ſame time, that a knowledge of ſuch as are moſt frequently employed, will eaſily be acquired from experience without any particular inſtructions.

OF ARABIC COMPOUNDS.

I. The manner in which different Arabic parts of ſpeech are employed to form a variety of compounded words made uſe of in the Perſian, is well explained by Sir William Jones in his Perſian Grammar; and

with reſpect to phraſes purely Arabic, and whole ſentences, which are often met with in Perſian authors, they require a perfect knowledge of the Aabic language, and do not belong to this place.

OF THE CONSTRUCTION OF ARABIC INFINITIVES, PARTICIPLES, SUBSTANTIVES, AND ADJECTIVES.

I. In the Perſian language, when Arabic adjectives or participles are made uſe of to qualify Arabic or Perſian ſubſtantives ſingular, they agree with them in gender and number.

Ex.

1. an Arabic sub. mas. qualified by an Arabic part. mas.	عاشق مذکور	the said lover.
2. an Arabic sub. fem. qualified by an Arabic part. pas. fem.	والده مکرمه	respected mother
3. a Pers. sub. mas. qualified by an Arabic ad. mas.	دوست قدیم	an old friend
4. a Pers. sub. fem. qualified by an Arabic ad. fem.	همشیره عزیزه	dear sister

II. When Arabic adjectives and participles are made uſe of to qualify Arabic and Perſian ſubſtantives maſculine and plural, they remain in the maſculine ſingular.

Ex.

1. an Arabic sub. mas. pl. with an Arabic part. mas. sing.	حکام مذکور	the said officers
2. a Pers. sub. mas. pl. with an Arab. part. mas. sing.	برادران مذکور	the said brethren

III. When Arabic adjectives and participles are made use of to qualify Arabic or Persian substantives feminine and plural, they are put in the feminine singular; and often, though not so properly, in the masculine singular.

Ex.
1. an Arabic sub. fem. plur. with Arabic part. sin. both fem. masc. تکلیفات مذکوره مذکور the said burthens

2. a Persian sub. fem. plur. with Arabic part. sing. both fem. and masc. زنان موصوفه موصوف accomplished women

IV. An Arabic substantive, in the Persian, is often rendered definite by a following Arabic adjective or participle having the article ال prefixed.

Ex. a sub. with a part. pas. نبی المختار the prophet elect

For an account of the genders of Arabic words, and of their perfect and imperfect plurals, I must again refer to Mr. *Richardson*'s Arabic Grammar; and to that of *Erpenius*, where the latter subject is treated at still greater length.

Of the INTRODUCTION *of the* ARABIC *into the* LANGUAGE *of* HINDOSTAN.

I. All the different species of infinitives, participles, substantives, and adjectives, which we have enumerated; and all compounds formed by *Arabic*

and *Perſian* words, are introduced into the language of *Hindoſtan*, in the ſame form, for the ſame purpoſes, and with the ſame freedom as in the *Perſian*: ſubmitting themſelves to the different rules of regimen and concord that are peculiar to *that* language; in the ſame manner as if they were words originally belonging to it. *Arabic* adverbs, prepoſitions, and conjunctions, are alſo uſed in the language of *Hindoſtan*; but I think leſs frequently than in the Perſian.

XV.

ON THE ASTRONOMICAL COMPUTATIONS OF THE HINDUS.

BY SAMUEL DAVIS, Esq.

Bhagalpur, 15th Feb. 1789.

IT is, I believe, generally admitted, that inquiries into the aſtronomy of the *Hindus* may lead to much curious information, beſides what relates merely to the ſcience itſelf; and that attempts to aſcertain the chronology of this ancient nation will, as they have hitherto done, prove unſatisfactory, unleſs aſſiſtance be derived from ſuch reſearches.

The following communication is not expected to contribute towards ſo deſirable a purpoſe; but, with all its imperfections, it may have the uſeful effect of awakening the attention of others in this country who are better qualified for ſuch inveſtigations, and of inciting them to purſue the ſame object more ſucceſsfully, by ſhowing that numerous treatiſes in *Sanſcrit* on aſtronomy are procurable, and that the *Brahmens* are extremely willing to explain them. As an encouragement to thoſe who may be inclined to amuſe themſelves in this way, I can farther venture to declare, from the experience I have had, that *Sanſcrit* books in this ſcience are more eaſily tranſlated than almoſt any others, when once the technical terms are underſtood: the ſubject of them admitting neither of metaphyſical reaſoning nor of metaphor, but being delivered in plain terms and generally illuſtrated with examples in practice, the meaning may be well enough made out, by the help of a *Pandit*, through the medium of the *Perſian* or the *Hindi* language,

Moreover it does not appear, that ſkill in the abſtruſe parts of modern mathematics is indiſpenſably neceſſary; but that with as much knowledge of geometry and the circles of the ſphere as, it may be ſuppoſed, moſt of the members of this ſociety poſſeſs, a conſiderable progreſs might be made in revealing many intereſting particulars, which at preſent lie hid to *Europeans* in the *Jyótiſh*, or aſtronomical, *Sáſtra*.

The prediction of eclipſes and other phenomena, publiſhed in the *Hindu Patra*, or Almanac, excited my curioſity long ago to know by what means it was effected; but it was not until lately that I had any means of gratification. I had before this been inclined to think, with many others, that the *Brahmens* poſſeſs no more knowledge in aſtronomy than they have derived from their anceſtors in tables ready calculated to their hands, and that few traces of the principles of the ſcience could be found among them; but by conſulting ſome *Sanſcrit* books, I was induced to alter my opinion. To ſatisfy myſelf on this ſubject, I began with calculating, by a modern *Hindu* formula, an eclipſe which will happen in next *November*; the particulars of which proceſs, although in ſome meaſure intereſting, were not ſufficient for my purpoſe, as it yet remained to be learnt on what grounds ſome tables uſed in it were conſtructed; and for this information I was referred to the *Surya Siddhanta*, an original treatiſe, and reputed a divine revelation. For a copy of the *Surya Siddhanta* I am indebted to Sir *Robert Chambers*, who procured it among other books at *Benares*; but the obſcurity of many technical terms made it ſometimes difficult to be underſtood even by the *Pandit* I employed, who was by no means deeply verſed in the ſcience he profeſſed. By his diligence, and through the obliging aſſiſtance of Mr. *Duncan* at *Benares*, who procured for me the *Tika*, or Commentary, this

difficulty was at length ſurmounted; and a computation of the above-mentioned eclipſe, not merely on the principles, but ſtrictly by the rules, of the *Surya Siddhanta*, is what I propoſe now to preſent you with, after ſuch preliminary obſervations as may be neceſſary to make it intelligible.

I ſuppoſe it ſufficiently well known, that the *Hindu* diviſion of the ecliptic into ſigns, degrees, &c. is the ſame as ours; that their aſtronomical year is ſydereal, or containing that ſpace of time in which the ſun, departing from a ſtar, returns to the ſame; that it commences on the inſtant of his entering the ſign *Aries*, or rather the *Hindu* conſtellation *Meſha**; that each aſtronomical month contains as many even days and fractional parts as he ſtays in each ſign; and that the civil differs from the aſtronomical account of time only in rejecting thoſe fractions, and beginning the year and month at ſunriſe, inſtead of the intermediate inſtant of the artificial day or night. Hence ariſes the unequal portion of time aſſigned to each month dependent on the ſituation of the ſun's apſis, and the diſtance of the vernal equinoctial colure from the beginning of *Meſhna* in the *Hindu* ſphere; and by theſe means they avoid thoſe errors which *Europeans*, from a different method of adjuſting their calendar by intercalary days, have been ſubject to. An explanation of theſe matters would lead me beyond my preſent intention, which is to give a general account only of the method by which the *Hindus* compute eclipſes, and thereby to ſhow, that a late *French* author was too haſty in aſſerting generally that they determine them

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* Or, to be more particular, on his entering the *Nacſhatra*, or lunar manſion (*Aſwini*). There were formerly only twenty-ſeven *Nacſhatras*: a 28th (*Abhijit*) has been ſince added, taken out of the 21ſt and 22d, named *Uttaraſhara* and *Sravana*. Theſe three in their order comprehend 10°, 5°, and 11° 40′ of the Zodiac: the reſt comprehend 13° 20′ each.

"by ſet forms, couched in enigmatical verſes,*" &c. So far are they from deſerving the reproach of ignorance which Monſ. *Sonnerat* has implied, that on inquiry, I believe, the *Hindu* ſcience of aſtronomy will be found as well known now as it ever was among them, although, perhaps, not ſo generally, by reaſon of the little encouragement men of ſcience at preſent meet with, compared with what they formerly did under their native princes.

It has been common with aſtronomers to fix on ſome epoch, from which, as from a radix, to compute the planetary motions; and the ancient *Hindus* choſe that point of time counted back when, according to their motions as they had determined them, they muſt have been in conjunction in the beginning of *Meſha*, or *Aries*; and coeval with which circumſtance they ſuppoſed the creation. This, as it concerned the planets only, would have produced a moderate term of years compared with the enormous antiquity that will be hereafter ſtated; but, having diſcovered a ſlow motion of the nodes and apſides alſo, and taking it into the computation, they found it would require a length of time correſponding with 1955884890 years now expired, when they were ſo ſituated, and 2364115110 years more, before they would return to the ſame ſituation again, forming together the grand anomaliſtic period denominated a *Calpa*, and fancifully aſſigned as the day of *Brahma*. The *Calpa* they divided into *Manwanteras*, and greater and leſs *Yugas*. The uſe of the *Manwantera* is not ſtated in the *Surya Siddhanta*; but that of the *Maha*, or greater *Yug*, is ſufficiently evident, as being an anomaliſtic period of the ſun and moon, at the end of which the latter, with her apogee and aſcending node, is found, together with the ſun,

* See the tranſlation of Monſ. *Sonnerat*'s Voyage.

in the firſt of *Aries*; the planets alſo deviating from that point only as much as is their latitude and the difference between their mean and true anomaly.

Theſe cycles being ſo conſtructed as to contain a certain number of mean ſolar days, and the *Hindu* ſyſtem aſſuming that at the creation, when the planets began their motions, a right line, drawn from the equinoctial point *Lanca* through the centre of the earth, would, if continued, have paſſed through the centre of the ſun and planets to the firſt ſtar in *Aries*: their mean longitude for any propoſed time afterwards may be computed by proportion. As the revolutions a planet makes in any cycle are to the number of days compoſing it, ſo are the days given to its motion in that time; and the even revolutions being rejected, the fraction, if any, ſhows its mean longitude at midnight under their firſt meridian of *Lanca*: for places eaſt or weſt of that meridian a proportional allowance is made for the difference of longitude on the earth's ſurface, called in *Sanſcrit* the *Deſantara*. The poſitions of the apſides and nodes are computed in the ſame manner; and the equation of the mean to the true place, determined on principles which will be hereafrer mentioned.

The diviſion of the *Maha Yug* into the *Satya*, *Treta*, *Dwapar*, and *Cali* ages, does not appear from the *Surya Siddhanta* to anſwer any practical aſtronomical purpoſe, but to have been formed on ideas ſimilar to the *golden*, *ſilver*, *brazen*, and *iron* ages of the *Greeks*. Their origin has however been aſcribed to the preceſſion of the equinoxes by thoſe who will of courſe refer the *Manwantera* and *Calpa* to the ſame foundation: either way the latter will be found anomaliſtic, as has been deſcribed, if I rightly underſtand the following paſſage in the firſt ſection of the *Surya Siddhanta*; the tranſlation of which is, I believe, here correctly given.

Q 2

——" Time, of the denomination *Murta**, is
" eſtimated by reſpirations; ſix reſpirations make a
" *Vicala*, ſixty *Vicalas* a *Danda*, ſixty *Dandas* a *Nac-*
" *ſhatra* day, and thirty *Nacſhatra* days a *Nacſhatra*
" month. The *Savan* month is that contained be-
" tween thirty ſucceſſive riſings of *Surya*, and varies in
" its length according to the *Lagna Bhuja*. Thirty
" *Tit'his* compoſe the *Chandra* month. The *Saura*
" month is that in which the ſun deſcribes one ſign
" of the Zodiac, and his paſſage through the twelve
" ſigns in one year, and one of thoſe years is a *Deva*
" day, or day of the Gods. When it is day at *Aſura* †
" it is night with the *Gods*, and when it is day with the
" *Gods* it is night at *Aſura*. Sixty of the *Deva* days
" multiplied by ſix give the *Deva* year, and twelve
" hundred of the *Deva* years form the aggregate of
" the four *Yugas*. To determine the *Saura* years
" contained in this aggregate, write down the following
" numbers, 4, 3, 2, which multiply by 10,000; the
" product 4,320,000 is the aggregate or *Maha Yuga*,
" including the *Sandhi* and *Sandhyanſa* ‡. This is
" divided into four *Yugas*, by reaſon of the diffe-
" rent proportions of *Virtue* prevailing on earth, in
" the following manner:—Divide the aggregate
" 4,320,000 by 10, and multiply the quotient by four
" for the *Satya Yug*, by three for the *Treta*, by two

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* This is mean ſydereal time:—A *Nacſhatra*, or ſydereal day, is the time in which the earth makes a turn upon its axis, or, according to the *Hindus*, in which the ſtars make one complete revolution. This is ſhorter than the *Savan*, or ſolar day, which varies in its length according to the *Lagna Bhuja*, or right aſcenſion, and alſo from the ſun's unequal motion in the ecliptic; for both which circumſtances the *Hindus* have their *equation of time*, as will appear in the calculation of the eclipſe.

† *Aſura*, the ſouth pole, the habitation of the *Aſura Loca*, or demons, with whom the *Devas*, who reſide at *Sumeru*, the north pole, wage eternal war.

‡ *Sandhi* and *Sandhyanſa*, the morning and evening twilight. The proper words, I believe, are *Sandhya* and *Sandhyanſa*.

" for the *Dwapar*, and by one for the *Cali Yug*. Di-
" vide either of the *Yugs* by ſix for its *Sandhi* and
" *Sandhyanſa*. Seventy-one *Yugs* make a *Manwan-*
" *tera*; and at the cloſe of each *Manwantera* there is
" a *Sandhi* equal to the *Satya Yug*, during which
" there is an univerſal deluge. Fourteen *Manwan-*
" *teras*, including the *Sandhi*, compoſe a *Calpa*, and
" at the commencement of each *Calpa* there is a
" *Sandhi* equal to the *Satya Yug*, or 1,728,000 *Saura*
" years. A *Calpa* is therefore equal to 1000 *Maha*
" *Yugs*. One *Calpa* is a day with *Brahma*, and his
" night is of the ſame length; and the period of his
" life is 100 of his years. One half of the term of
" *Brahma*'s life, or fifty years, is expired, and of the
" remainder the firſt *Calpa* is begun; and ſix *Man-*
" *wanteras*, including the *Sandhi*, are expired. The
" ſeventh *Manwantera*, into which we are now ad-
" vanced, is named *Vaivaſwata*. Of this *Manwantera*
" twenty-ſeven *Maha Yugs* are elapſed, and we are
" now in the *Satya Yug* of the twenty-eighth, which
" *Satya Yug* conſiſts of 1,728,000 *Saura* years. The
" whole amount of years expired from the begin-
" ning of the *Calpa* * to the preſent time, may hence

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* Conſtruction of the *Calpa*.

		Years.
Cali,	$\frac{4320000}{10}$ =	432000
Dwapar,	$\frac{4320000}{10} \times 2$ =	864000
Treta,	$\frac{4320000}{10} \times 3$ =	1296000
Satya,	$\frac{4320000}{10} \times 4$ =	1728000
Aggregate or *Maha Yug*,		4320000
		71
Manwantera, - -		306720000
With a *Sandhi* equal to the *Satya Yug*, - - -		1728000
		308448000
		14
Calpa, - - - - - -		4318272000
With a *Sandhi* equal to the *Satya Yug*, - -		1728000
Whole duration of *Calpa*,		4320000000

Computation of the period elapſed of the *Calpa* at the end of the laſt *Satya* age, when the *Surya Siddhanta* is ſuppoſed to have been written.

	Years.
Sandhi at the beginning of the *Calpa*, - - - -	1728000
6 *Manwanteras*, or 308448000 × 6 =	1850688000
27 *Maha Yugs* of the 7th *Manwantera*, or 4320000 × 27 =	116640000
Satya Age of the 28th *Maha Yug*, - - =	1728000
	1970784000

Q 3

" be computed; but from the number of years so
" found, must be made a deduction of one hundred
" times four hundred and seventy-four divine years,
" or of that product multiplied by three hundred and
" sixty for human years, that being the term of *Brah-*
" *ma*'s employment in the creation; after which the
" planetary motions commenced.

" Sixty *Vicalas* make one *Cala*, sixty *Calas* one
" *Bhaga*, thirty *Bhagas* one *Rasi*, and there are
" twelve *Rasis* in the *Bhagana**.

" † In one *Yug*, *Surya*, *Buddha*, and *Sucra* perform
" 4320000 *Madhyama* revolutions through the Zodiac,
" *Mangala*, *Vrihaspati*, and *Sani* make the same num-
" ber of *Sighra* revolutions through it; *Chandra* makes
" 57753336 ‡ *Madhyama* revolutions; *Mangala*
" 2296832 *Madhyama* revolutions; *Buddha*'s *Sighras*
" are 17937060; *Vrihaspati*'s *Madhyamas* 364220;
" *Sucra*'s *Sighras* 7022376; *Sani*'s *Madhyamas* are
" 146568. The *Chandrochcha* revolutions are 488203;
" the retrograde revolutions of the *Chandrapata* are
" 232238.

" The time contained between sunrise and sunrise
" is the *Bhumi Savan* day: the number of those days

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* The division of the *Bhagana*, or Zodiac, into signs, degrees, &c.

† *Surya* the Sun; *Buddha*, Mercury; *Sucra*, Venus; *Mangala*, Mars; *Vrihaspati*, Jupiter: *Sani*, Saturn, *Chandra*, the Moon; the *Chandra Uchcha*, or *Chandrochcha*, the Moon's apogee, *Chandra Pata*, the Moon's ascending node. The *Madhyama* revolutions of Mars, Jupiter, and Saturn, and the *Sighra* revolutions of Venus and Mercury, answer to their revolutions about the Sun.

‡ 57753336—4320000 53433336 lunar months, or lunations in a *Yug*;

$$\text{and } \frac{1577917828}{53433336} = \overset{\text{D.}}{29}\ \overset{\text{D.}}{31}\ \overset{\text{P.}}{50},\ 6,\ \&c.$$

in each mean lunation, or in English time, $\overset{\text{D.}}{29}.\ \overset{\text{H.}}{12}.\ \overset{\text{M.}}{44}.\ \overset{\text{S.}}{2}\ 47'''\ 36''''$.
53433336—51840000=1593336 *Adhi* or intercalary lunar months in 4320000 solar sydereal years.

" contained in a *Yug* is 1577917828*; the number
" of *Nacshatra* days 1582237828†; of *Chandra* days
" 1603000080; of *Adhi* months 1593336; of *Cshaya*
" *Tit'his* 25082252; of *Saura* months 51840000.
" From either of the planets *Nacshatra* days deduct

* $\frac{1577917828}{4320000}$ = 365. 15. 31. 31. 24. diurnal revolutions of the Sun, the length of the *Hindu* year.

† $\frac{1582237828}{4320000}$ = 365. 15. 31. 31. 24. diurnal revolutions of the stars in one year.

$\frac{1577917828}{57753336}$ = 27. 19. 18. 1. 37. &c. the Moon's periodical month. The 1603000080 *Chandra*, or lunar days, called also *Tit'his*, are each one-thirtieth part of the moon's synodical month or relative period, and vary in length according to the inequality of her motion from the sun. The *Cshaya Tit'his* and *Adhi*, or intercalary lunar months, are sufficiently evident.

The sun and planets preside alternately over the days of the week, which are named accordingly. The first day after the creation was *Ravivar*, or *Sunday*: it began at midnight, under the meridian of *Lanca*; and the *Ravivar* of the *Hindus* corresponds with our Sunday. The sun and planets in the same manner govern the years: hence they may be said to have *weeks* of years. *Daniel*'s prophecy is supposed to mean *weeks* of years.

The *Hindu* cycle of 60, supposed by some to be the Chaldean *Sosos*, is referred to the planet Jupiter: " one of these years is " equal to the time in which by the mean motion, he (*Vribaspati*) " advances one degree in his orbit." (Commentary on the *Surya Siddhanta*.) This cycle is, I believe, wholly applied to astrology. Neither this cycle of 60 nor the *Pirri*'s day are mentioned in this part of the *Surya Siddhanta*, where they might be expected to occur. Perhaps on inquiry there may be found some reason for supposing them both of a later invention. " The *Pitris* inhabit be- " hind *Chandra*, and their mid-day happens when *Chandra* is in " conjunction with *Surya*; and their midnight, when *Chandra* is in " opposition to *Surya*; their morning, or sunrise, is at the end " of half the *Crishna Pacsha*; and their sunset at the end of half " the *Sucla Pacsha*; this is declared in the *Sacelya Sanhita*. Their " names are *Agni*, *Swati*, &c. their day and night are therefore together equal to one *Chandra* month." (Commentary). Hence, it appears, the *Hindus* have observed that the moon revolves once on her axis in a lunar month, and consequently has the same side always opposed to the earth. They have also noticed the difference of her apparent magnitude in the horizon and on the meridian, and endeavour to explain the cause of a phenomenon, which *Europeans* as well as themselves are at a loss to account for.

"the number of its revolutions, the remainder will
"be the number of its *Savan* days contained in a *Yug*.
"The difference between the number of the revolu-
"tions of *Surya* and *Chandra* gives the number of
"*Chandra* months; and the difference between the
"*Saura* months and *Chandra* months gives their num-
"ber of *Adhi* months. Deduct the *Savan* days from
"the *Chandra* days, the remainder will be the num-
"ber of *Tit'hi Cshayas*. The number of *Adhi* months,
"*Tit'hi Cshayas*, *Nacshatra*, *Chandra*, and *Savan*
"days, multiplied severally by 1000, give the num-
"ber of each contained in a *Calpa*.

"The number of *Mandochcha* revolutions, which
"revolutions are direct, or according to the order of
"the signs contained in a *Calpa*, is of *Surya* 387;
"of *Mangala* 204; of *Buddha* 368; of *Vrihaspati*
"900; of *Sucra* 535; of *Sani* 39.

"The number of revolutions of the *Patas*, which
"revolutions are retrograde, or contrary to the order
"of the signs contained in a *Calpa*, is of *Mangala*
"214; of *Buddha* 488: of *Vrihaspati* 174; of *Su-*
"*cra* 903; of *Sani* 662. The *Pata* and *Uchcha* of
"*Chandra* are already mentioned."

It must be observed, that, although the planetary motions as above determined, might have served for computations in the time of *Meya*, the author of the *Surya Siddhanta*, yet for many years past they have not been found to agree with the observed places in the heavens in every instance; and that corrections have accordingly been introduced, by increasing or reducing those numbers. Thus the motions of the moon's apogee and node are now increased in computations of their places by the addition of four revolutions each in a *Yug* to their respective numbers above given. The nature of these corrections, denominated in *Sanscrit*

Bija, is explained in a paſſage of the *Tica*, or Commentary, on the *Surya Siddhanta*, wherein is maintained the priority of that *Saſtra*, in point of time, to all others. The tranſlation of that paſſage, together with the text it illuſtrates, is as follows:

(*Surya Siddhanta*). " *Arca* (the Sun) addreſſing " *Meya*, who attended with reverence, ſaid, Let your " attention, abſtracted from human concern, be wholly " applied to what I ſhall relate. *Surya* in every for- " mer *Yug* revealed to the *Munis* the invariable ſcience " of aſtronomy. The planetary motions may alter; " but the principles of that ſcience are always the " ſame."

The Commentary. — " Hence it appears, that the " *Surya Siddhanta* was prior to the *Brahma Siddhanta* " and every other *Saſtra*; becauſe this *Saſtra* muſt be " the ſame that was revealed *in every former Yug*, al- " though the motions of the planets might have been " different. The variation in the planetary motions " is mentioned in the *Viſhnu Dhermotter*, which di- " rects that the planet be obſerved w th an inſtru- " ment, whereby their agreement or diſagreement " may be determined in regard to their computed " places; and in caſe of the latter, an allowance of " *Bija* accordingly made. *Vaſiſht'ha* in his *Siddhanta* " alſo recommends this occaſional correction of *Bija*, " ſaying to the *Muni Mandavya*, " I have ſhown you " how to determine ſome matters in aſtronomy; but " the mean motion of *Surya* and the other planets " will be found to differ in each *Yug*." Accordingly " *Aryabhatta*, *Brahmagupta*, and others, having ob- " ſerved the heavens, formed rules on the principles " of former *Saſtras*, but which differed from each " other in proportion to the diſagreements which " they ſeverally obſerved of the planets, with re- " ſpect to their computed places.

" Why the *Munis*, who certainly knew, did not
" give the particulars of those deviations, may seem
" unaccountable, when the men *Aryabhatta*, *Brahmagupta*, and others, have determined them. The
" reason was, that those deviations are not in themselves uniform; and to state their variations would
" have been endless. It was therefore thought better,
" that examinations at different times should be made,
" and due corrections of the *Bija* introduced. A
" *Ganita Sastra*, whose rules are demonstrable, is
" true; and when conjunctions, oppositions, and
" other planetary phenomena, calculated by such
" *Sastras*, are found not to agree with observation,
" a proportionable *Bija* may be introduced without
" any derogation from their credit. It was therefore
" necessary that this *Sastra* (the *Surya Siddhanta*)
" should be revealed in each *Yug*, and that other
" *Sastras* should be composed by the *Munis*.

" The original *Sastra* then appears to be the *Surya*
" *Siddhanta*; the second, the *Brahma Siddhanta*; the
" third, the *Paulastya Siddhanta*; the fourth, the *Soma*
" *Siddhanta*."

In the following table are given the periodical revolutions of the planets, their nodes and apsides, according to the *Surya Siddhanta*. The corrections of *Bija* at present used, are contained in one column *, and the inclination of their orbits to the ecliptic in another. The obliquity of the ecliptic is inserted ac-

* This I must, however, at present omit, not having as yet discovered the corrections of this kind that will bring even the Sun's place, computed by the *Surya Siddhanta*, exactly to an agreement with the astronomical books in present use. Of those books, the principal are the *Grahalaghava*, composed about 268 years ago, the tables of *Macaranda* used at *Benares* and *Tirbut*, and the *Siddhanta Rahasya*, used at *Nadiya*; the last written in 1513 *Saca*, or 98 years ago.

cording to the ſame *Saſtra*. Its diminution does not appear to have been noticed in any ſubſequent treatiſe. In the tables of *Macaranda*, and alſo in the *Grahalaghava*, the latter written only 268 years ago, it is expreſſly ſtated at twenty-four degrees.

The motion of the equinoxes, termed in *Sanſcrit* the *Cranti*, and ſpoken of in the *Tica*, or commentary, on the *Surya Siddhanta* as the Sun's *pata* or node, is not noticed in the foregoing paſſage of that book; and, as the *Hindu* aſtronomers ſeem to entertain an idea of the ſubject different from that of its revolution through the *Platonic* year, I ſhall farther on give a tranſlation of what is mentioned, both in the original and commentary, concerning it.

The next requiſite for the computation of the eclipſe is the portion of the *Calpa* expired to the preſent time, which is determined in the following manner:

The *Surya Siddhanta* is ſuppoſed to have been received, through divine revelation, towards the cloſe of the *Satya* age, at the end of which, 50 of the years of *Brahma* were expired, and of the next *Calpa*, or day, 6 *Manwanteras*, 27 greater *Yugs*, and the *Satya* age of the the 28th *Yug*, together with the *Sandya* or twilight at the beginning of the *Calpa*; the aggregate of which ſeveral periods is 1970784000 years elapſed of the *Calpa* to the beginning of the laſt *Treta* age; to which add the *Treta* and *Dwapar* ages, together with the years elapſed of the preſent *Cali* age, for the whole amount of ſydereal years from the beginning of the *Calpa* to the preſent *Bengal* year. But in the foregoing quotation it is obſerved, from that amount of years muſt be made a deduction of 47400 divine, or 17064000 human or ſydereal years, the term of *Brahma*'s employment in the work of

THE TABLE. See page 236.

The Planets in their order.	Sydereal Period.	Period of the Apsides.	Period of the Nodes.	Mean motion per day ′ ″ per danda ″ ‴	Inclination of the Orbit.	Cacsha, or circumference of the Orbit.
	Days. D. P. V.	Days. D.	Days. D.	″ ″		Yojan.
The Moon,	27 19 18 1 &c.	3232 50 —	6794 23	790 35	4 · 30	324000
Mercury,	87 58 10 ———	4287820184 46 —	3233742458 11	186 24	2 —	1043208
Venus,	281 39 38 ———	2949379117 45 &c.	1747417306 45	37	2 —	26646637
The Sun,	265 15 13 31 24	4077307049 5 —	Precession of the equinoxes 54″ per year.	59 8	Obliquity of the Ecliptic 24°	4331500
Mars,	866 59 50 38	7735097392 9 &c.	7373447794 23 &c.	31 26	1 30	8146909
Jupiter,	4332 19 14 20 &c.	1753242031 6 &c.	9068493264 22 &c.	5 —	1 —	51375764
Saturn,	10765 46 2 18 &c.	42767123794 52 &c.	2383561673 42 &c.	2 —	2 —	127668255

The longitude of the Sun's apogee in the *Hindu* sphere is 2ˢ, 17°, 17′, 15″, to which add the *Ayanansa* 19°, 21,′ 27″, the sum 3, 6°, 38′, 42″, is its place, according to *European* expression. In this the *Hindu* account differs about 1° 22′ from the observations of *European* astronomers, who determine the place of the earth's aphelion in the present age to be 9ˢ, 8°, 1′. There is much greater disagreement with respect to the aphelia and nodes of the other planets.

On supposition that the obliquity of the ecliptic was accurately observed by the ancient *Hindus*, as 24°, and that its decrease has been from that time half a second a year, the date of the *Surya Siddhanta* will be about 3840 years. It is remarkable that the *Hindus* do not appear to have noticed its decrease.

The *Cacshas* are explained farther on.

creation; for, as the universe was not completed, the planetary motions did not commence until that portion of the *Calpa* was elapsed.

This deduction appears to have been intended as a correction, which, without altering the date of the *Calpa* as settled, probably, by yet more ancient astronomers, might (joined perhaps with other regulations) bring the computed places of the planets to an agreement with their observed places, when the *Surya Siddhanta* was written; and, as the arguments of its commentator in support of the propriety of it, without prejudice to other authors, contain some curious particulars, I hope I may be excused for departing from my immediate object to insert a translation of them.

" In the *Surya Siddhanta*, *Soma Siddhanta*, *Praja-*
" *Peti*, *Vasisht'ha*, and other *Sastras*, this deduction
" is required to be made from the *Calpa*, because at
" the end of that term the planetary motions com-
" menced. The son of *Jishnu*, who understood four
" *Vedas*, and *Bhascaracharya*, considered these mo-
" tions as commencing with the *Calpa*. It may seem
" strange that there should be such a disagreement.
" Some men say, As it is written that the *Calpa* is
" the day of *Brahma*, and as a day is dependent on
" the rising and setting of the sun, the motion of the
" sun and planets must have begun with the *Calpa*;
" and therefore *Brahmagupta* should be followed:
" but I think otherwise. The *Calpa*, or *Brahma*'s day,
" is not to be understood as analogous to the solar day
" otherwise than as containing a determined portion
" of time; neither is it at all dependent on the com-
" mencement of the *Calpa*; but, being composed of the
" same periods as the latter, it will not end until the
" term of years here deducted shall be expired of the
" next *Calpa*. The motions of the *Grahas* must

" therefore be computed from the point of time here
" ſtated, as the beginning of *Brahma*'s day, and not
" as *Brahmagupta* and others direct, from the begin-
" ning of the *Calpa*; which will not be found to an-
" ſwer.

" Other men ſay, that rules derived from the *Ganita*
" *Saſtra* and agreeing with obſervation, are right;
" that any period deduced from ſuch a mode of com-
" putation, and the planets determined to have been
" then in the firſt of *Meſha*, may be aſſumed; that
" it will therefore anſwer either way, to conſider theſe
" motions as beginning with the *Calpa*, or after the
" above mentioned period of it was expired. This
" however is not true; for in the inſtance of *Mangala*
" there will be found a great difference, as is here
" ſhown. The revolutions of *Mangala* in *a Calpa*,
" according to *Brahmagupta*, are 2296828522, and,
" by the rule of proportion, the revolutions of *Man-*
" *gala* in 17064000 years are 9072472 7^s 28° 0′ 16″*.
" For any other planet, on trial, a ſimilar diſagree-
" ment will be found; and the propoſition of comput-
" ing from either period muſt be erroneous. More-
" over, of what uſe is it to make computations for a
" ſpace of time, when the planets and their motions
" were not in being?

" It might, however, from the foregoing circum-
" ſtances, be imputed to *Brahmagupta* and the
" reſt, that they have given precepts through igno-

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* Becauſe $\frac{2296828522 \times 17064000}{4320000000}$ = 9072472 (Revolutions.) 7^s 28° 0′ 16″

" rance, or with intent to deceive — That, having
" ſtated the revolutions of the planets different from
" the account revealed by *Surya*, they muſt certainly
" have been in error—That *Brahmagupta* could not
" have counted the revolutions from the beginning of
" the *Calpa:* neither could he from the mean mo-
" tion of the planets have ſo determined them.—He
" was a mortal, and therefore could not count the re-
" volutions.—Although the rule of proportion ſhould
" be granted to have ſerved his purpoſe for the revo-
" lutions of the planets, yet it certainly could not for
" thoſe of their *Mandochcha*, becauſe it was not within
" the term of a man's life to determine the mean mo-
" tion of the *Mandochcha*; and this aſſertion is juſti-
" fied by the opinion of *Bhaſcaracharya*. But the rule
" of proportion could not have anſwered even for the
" planets; for, although their mean motion be ob-
" ſerved one day, and again the next, how can a man
" be certain of the exact time elapſed between the two
" obſervations? And if there be the ſmalleſt error in
" the elapſed time, the rule of proportion cannot
" anſwer for ſuch great periods. An error of the
" 10-millionth part of a ſecond (*Vicala*) in one day,
" amounts to forty degrees * in the computation of a
" *Calpa*; and the miſtake of 1-tenth of a reſpiration in
" one *Saura* year, makes a difference in the ſame pe-
" riod of 20000 days. That it is therefore evident,
" *Brahmagupta*'s motive for directing the planetary
" motions to be computed as commencing with the
" *Calpa*, was to deceive mankind, and that he had
" not the authority of the *Munis*, becauſe he differs
" from the *Surya Siddhanta*, *Brahma Siddhanta*, *Soma*
" *Siddhanta*; from *Vaſiſhtha*, and other *Munis*.

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* The errror would be more than 43°

" Such opinions would have no foundation, as I
" ſhall proceed to ſhow. *Brahmagupta*'s rules are
" conſiſtent with the practice of the *Pandits* his pre-
" deceſſors; and he formed them from the *Purana*
" *Viſhnu Dhermottara*, wherein is contained the
" *Brahma Siddhanta*; and the periods given by *Ary-*
" *abhatta* are derived from the *Paraſera Siddhanta*:
" the precepts of the *Munis* are therefore the autho-
" rities of *Brahmagupta*, *Aryabhatta*, and *Bhaſca-*
" *racharya*, whoſe rules cannot be deceitful. The
" *Munis* themſelves differed with regard to the num-
" ber of *Savan* days in a *Yug*, which is known from
" the *Pancha Siddhanta*, compoſed by *Vara Acharya*;
" wherein are propoſed two methods of computing
" the ſun's place, the one according to the *Surya*
" *Siddhanta*, the other according to the *Romaca Sidd-*
" *hanta*; whence it appears that there were diffe-
" rent rules of computation even among the *Munis*.
" It is alſo mentioned in the *Tica* on the *Varaha*
" *Sanhita*, that, according to the *Paulaſtya Siddhanta*,
" there was formerly a different number of *Savan*
" days eſtimated in a *Yug*. The maxims therefore of
" *Brahmagupta* and the other two, agreeing with thoſe
" of the *Munis*, are right; but, ſhould it even be
" ſuppoſed that the *Munis* themſelves could be
" miſtaken, yet *Brahmagupta* and the other two had
" the ſanction of the *Vedas*, which in their numerous
" *Sac'has* (branches) have diſagreements of the ſame
" kind; and, according to the *Sacalya Sanhita*,
" *Brahma*, in the revelation he made to *Nared*, told
" him, although a circumſtance or thing were not
" perceptible to the ſenſes, or reconcileable to rea-
" ſon, if authority for believing it ſhould be found
" in the *Vedas*, it muſt be received as true.

" If a planet's place, computed both by the *Surya*
" *Siddhanta* and *Paraſera Siddhanta*, ſhould be found

" to differ, which rule muſt be received as right?
" I anſwer, That which agrees with his place
" by obſervation: and the *Munis* gave the ſame di-
" rection. If computations from the beginning of
" the *Calpi*, and from the period ſtated in the *Surya*
" *Siddhanta* give a difference, as appears in the in-
" ſtance of *Mangala*, which of the two periods to be
" computed from is founded in truth? I ſay it is
" of no conſequence to us which, ſince our ob-
" ject is only to know which period anſwers for com-
" putation of the planetary places in our time, not
" at the beginning of the *Calpa*. The difference
" found in computing according to *Brahmagupta* and
" the *Munis*, muſt be corrected by an allowance of
" *bija*, or by taking that difference as the *eſhepa*;
" but the books of the *Munis* muſt not be altered,
" and the rules given by *Brahmagupta*, *Varacharya*,
" and *Aryabhatta* may be uſed with ſuch precautions.
" Any perſon may compoſe a ſet of rules for the com-
" mon purpoſes of aſtronomy; but, with regard to
" the duties neceſſary in eclipſes, the computation
" muſt be made by the books of the *Munis*, and the
" *bija* applied; and in this manner it was that *Vara-*
" *ha*, *Aryabhatta*, *Brahmagupta*, and *Ceſava Samvat-*
" *ſara*, having obſerved the planets and made due al-
" lowance of *bija*, compoſed their books.

" *Caneſa* mentions, that the *Grahas* were right in
" their computed places in the time of *Brahma*,
" *Acharya*, *Vaſiſht'ha*, *Caſyapa*, and others, by the
" rules they gave, but in length of time they differed;
" after which, at the cloſe of the *Satya* age, *Surya*
" revealed to *Meya* a computation of their true places.
" The rules then received anſwered during the *Treta*
" and *Dwapar* ages, as alſo did other rules formed
" by the *Munis* during thoſe periods. In the begin-
" ning of the *Cali Yug*, *Paraſera*'s book anſwered;
" but *Aryabhatta*, many years after, having examined

" the heavens, found some deviation, and introduced
" a correction of *bija*. After him, when further de-
" viations were observed, *Durga Sinha*, *Mihira*, and
" others, made corrections. After them came the
" son of *Jiṣṇu* and *Brahmagupta*, and made correc-
" tions. After them *Cesava* settled the places of
" the planets; and, sixty years after *Cesava*, his son
" *Ganesa* made corrections."

We have now, according to the *Hindu* system, the mean motion of the planets, their nodes and apsides, and the elapsed time since they were in conjunction in the first of *Mesha*, with which, by the rule of proportion, to determine their mean longitude for any proposed time of the present year. It is, however, observed in the *Surya Siddhanta*, that to assume a period so great is unnecessary; for use, the computation may be made from the beginning of the *Treta*-age, at which instant all the *Grahas*, or moveable points in the heavens, were again in conjunction in *Mesha*, except the apogees and ascending nodes, which must therefore be computed from the creation. The same is true of the beginning of the present *Cali*-age; for the greatest common divisor of the number of days composing the *Maha Yug* and the planetary revolutions in that period, is four, which quotes 394479457 days, or 1080000 years; and the *Treta* and *Dwapar* ages contain together just that number of years. The present *Hindu* astronomers therefore find it unnecessary to go farther back than the beginning of the *Cali Yug* * in determining the mean lon-

* Neither do they, in computing by the formulas in common use, go farther back than to some assigned date of the æra *Saca*; but, having the planets places determined for that point of time, they compute their mean places and other requisites for any proposed afterwards by tables, or by combinations of figures contrived to facilitate the work: as in *Grahalaghava*, *Saddhanta Rahasya*, and many other books. An enquirer into *Hindu* astronomy having access to such books only, might easily be led to assert

gitude of the planets themſelves; but for the poſition of their apſides and nodes, the elapſed time ſince the creation muſt be uſed; or at leaſt in inſtances, as of the ſun, when the numbers 387 and 432,000000 are incommenſurable but by unity. I have however in the accompanying computation, taken the latter period in both caſes.

For the equation of the mean to the true anomaly, in which the ſolution of triangles is concerned, and which is next to be conſidered, the *Hindus* make uſe of a canon of ſines, conſtructed according to the *Surya Siddhanta*, in the following manner:—" Divide " the number of minutes contained in one ſine 1800 " by eight, the quotient 225 is the firſt *Jyapinda*, or " the firſt of the twenty-fourth portions of half the " ſtring of the bow. Divide the firſt *Jyapinda* by " 225, the quotient 1 deduct from the dividend, " and the remainder 224 add to the firſt for the ſe- " cond *Jyapinda* 449. Divide the ſecond *Jyapinda* " by 225, the quotient being 1, and the fraction " more than half a minute, deduct 2 from the fore- " going remainder 224, and add the remainder " ſo found to the ſecond for the third *Jyapinda* 671. " Divide this by 225, the quotient 3 deduct from " the laſt remainder 222; the remainder ſo found " 219, add to the third for the fourth *Jyapinda* 890. " Divide this by 225, and the quotient deduct from " the laſt remainder; the remainder ſo found add " to the fourth for the fifth *Jyapinda* 1105, and " proceed in this manner until the twenty-four *Cra-*

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that the *Brahmans* complete eclipſes *by ſet forms*, *couched in enigmatical verſes*, out of which it would be difficult to develope their ſyſtem of aſtronomy; and this I apprehend was the caſe with Monſ. *Sonnerat*. The *Jyotiſh Pandits* in general, it is trne, know little more of aſtronomy than they learn from ſuch books, and they are conſequently very ignorant of the principles of the ſcience; but there are ſome to be met with who are better informed.

" *majyas* ‡ are completed, which will be as follows:

1 2 3 4 5 6 7 8
" 225, 449, 671, 890, 1105, 1315, 1520, 1719,
9 10 11 12 13 14 15 16
" 1910, 2093, 2267, 2431, 2585, 2728, 2859, 2978,
17 18 19 20 21 22 23 24
" 3084, 3177, 3256, 3321, 3372, 3409, 3431, 3438,

" For the *utcramajy* *, the twenty-third *cramajya* " deducted from the *trijya* or twenty-fourth *cramajya*, " leaves the firſt *nicramajya*; the twenty-ſecond de- " ducted from the twenty-third, leaves the ſecond " *utcramajya*; the twenty-firſt from the twenty-ſecond, " leaves the third; the twentieth from the twenty- firſt, leaves the fourth. In the ſame manner pro- ceed until the *utcramajyas* are completed; which

1 2 3 4 5 6 7
" will be as follows: 7, 29, 66, 117, 182, 261, 354,
8 9 10 11 12 13 14 15 16
" 460, 579, 710, 853, 1007, 1171, 1345, 1528, 1719,
17 18 19 20 21 22 23 24
" 1928, 2123, 2233, 2548, 2767, 2989, 3213, 3438."

So far the *Surya Siddhanta* on the ſubject of the ſines. The commentator ſhews how they are geome- trically conſtructed:—" With a radius deſcribe a " circle, the periphery of which divide into 21600 " equal parts, or minutes. Draw north and ſouth, " and eaſt and weſt, lines through the centre: ſet " off contrarywiſe from the eaſt point, 225 on the " periphery, and draw a ſtring from thoſe extremi- " ties acroſs the *trijya* †. The ſtring is the *jya*, and " its half the *ardhajya*, called *jiva*. The *Pandits* ſay, " a planet's place will correſpond with the *ardhajya*; " by which, therefore, computations of their places " are always made; and by the term *jya* is always " underſtood the *ardhajya*. The firſt *jya* will be " found to contain 449 minutes, and the operation, " repeated to twenty-four diviſions, will complete the " *cramajya*. In each operation, the diſtance con-

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‡ *Cramajyas*, right ſines

† *Tryjya*, the radius.

* *Utcramajyas*, verſed ſines.

" tained between the *jya* and its arc, or that line
" which repreſents the arrow of a bow, muſt be exa-
" mined, and the number of minutes therein con-
" tained and taken for the *utcramajya*. The circle
" may repreſent any ſpace of land; the *bhujajya* * is
" the *bhuja*; the *cotijya* the *coi*, and the *trijya* the
" *carna*. The ſquare of the *bhujajya* deducted from
" the ſquare of the *trijya*, leaves the ſquare of the
" *cotijya*; the root of which is the *cotijya*; and, in
" the ſame manner, from the *cotijya* is determined the
" *bhujajya*. The *cotyutcramajya* deducted from the
" *trijya*, leaves the *bhujacramajya*. The *bhujot-crama-*
" *jya* deducted from the *trijya* leaves the *coticramajya*.
" When the *bhujajya*, is the firſt diviſion of the *trijya*,
" the *cotijya* is the twenty-three remaining diviſions;
" which *cotijya* deducted from the *trijya*, leaves the
" *bhujotcramajya*. On this principle are the *jyas* gi-
" ven in the text: † they may be determined by cal-
" culation alſo, as follows:

" The *trijya* take as equal to 3438 minutes, and con-
" taining twenty-four *jyapindas*; its half is the *jya* of
" one ſine, or 1719′; which is the eighth *jyapinda*, or
" the ſixteenth *cotijyapinda*. The ſquare of the
" *trijya* multiply by three, and divide the product by
" 4, the ſquare root of the qoutient is the *jya* of
" two ſines, or 2977′. The ſquare root of half the
" ſquare of the *trijya* is the *jya* of one ſine and an half
" (45°) or 2431; which, deducted from the *trijya*,
" leaves the *utcramajya* 1007′. By this *utcramajya*
" multiply the *trijya*; the ſquare root of half the pro-
" duct is the *jya* of 22°, 30′, or 1315″. The ſquare
" of this deduct from the ſquare of the *trijya*, the

* *Bhujajya*, the ſine complement.

† A diagram might here be added for illuſtration; but it muſt be unneceſſary to any one who has the ſmalleſt knowledge of Geometry.

R 3

" ſquare root of the difference is the *jya*, of 67°, 30′,
" or 3177′ which is the *cotijya* of 22°, 30′ equal to
" 1315. The *bhujajya* and *cotijya* deducted ſeverally
" from the *trijya*, leaves the *utcramajya* of each 2123″,
" and 261′."—&c.

This is ſufficient to ſhow, that the *Hindus* have the right conſtruction of the ſines, although they do not appear, from any thing I can learn, ever to have carried it farther than to twenty-four diviſions of the quadrant, as in the following table. Inſtances of the like inaccuracy will occur in the courſe of this paper. The table of ſines may perhaps be more clearly repreſented in the following manner:

Right Sines, the Radius containing 3438 *Minutes.*

Arc.	Sine	Arc.	Sine	Arc.	Sine.
1ſt = 225′ = 3°,45	225	9th = 2025 = 33°,45	1910	17th = 3825 = 63°,45	3084
2d = 450 = 7 ,30	449	10th = 2250 = 37 ,30	2093	18th = 4050 = 67 ,30	3177
3d = 675 = 11 ,15	671	11th = 2475 = 41 ,15	2267	19th = 4275 = 71 ,15	3256
4th = 900 = 15 ,—	890	12th = 2700 = 45 ,—	2431	20th = 4500 = 75 ,—	3321
5th = 1125 = 18 ,45	1105	13th = 2925 = 48 ,45	2585	21ſt = 4725 = 78 ,45	3376
6th = 1350 = 22 ,30	1315	14th = 3150 = 52 ,30	2728	22d = 4950 = 82 ,30	3400
7th = 1575 = 26 ,15	1520	15th = 3275 = 56 ,15	2859	23d = 5175 = 86 ,15	3431
8th = 1800 = 30, —	1719	16th = 3600 = 60 ,—	2978	24th = 5400 = 90 ,—	3438

Verſed Sines.

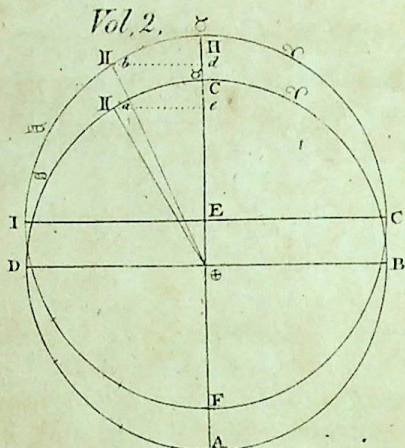
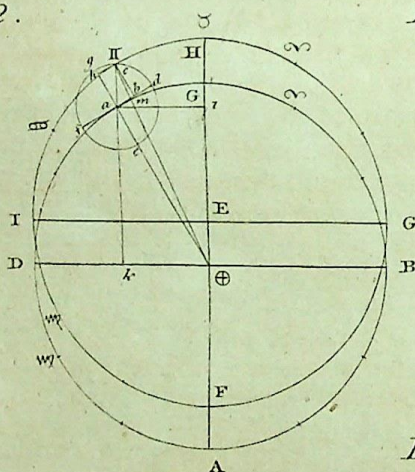
Arc.	Sine	Arc.	Sine.	Arc.	Sine.
1ſt = 225′ = 3°,45	7	9th = 2025 = 33°,45	579	17th = 3825 = 63°,45	1928
2d = 450 = 7 ,30	2[illegible]	10th = 2250 = 37 ,30	[illegible]10	18th = 4050 = 67 ,30	2123
3d = 675 = 11 ,15	66	11th = 2475 = 41 ,15	853	19th = 4275 = 71 ,15	2233
4th = 900 = 15 ,	117	12th = 2700 = 45 ,—	1007	20th = 4500 = 75 ,—	2548
5th = 1125 = 18 ,45	18[illegible]	13th = 2925 = 48 ,45	1171	21ſt = 4725 = 78 ,45	2767
6th = 1350 = 22 ,30	261	14th = 3150 = 52 ,30	1345	22d = 4950 = 82 ,30	2989
7th = 1575 = 26 ,15	354	15th = 3275 = 56 ,15	1528	23d = 5175 = 86 ,15	3213
8th = 1800 = 30 ,—	46[illegible]	16th = 3600 = 60 ,—	1719	24th = 5400 = 90 ,—	3438

For the ſines of the intermediate arcs, take a mean proportion of the tabular difference, as for the ſine of 14°, which is between the third and fourth tabular arcs, or 165 minutes exceeding the third; therefore 225′

being the difference of thoſe arcs, and 219 the difference of their ſines, $\frac{165' \times 219'}{225'}$=160′, 36″, or a mean proportional number, to be added to the ſine of the third tabular arc, for the ſine required of 14°, or 831′ 36″. In the ſexageſimal arithmetic, which appears to be univerſally uſed in the *Hindu* aſtronomy, when the fraction exceeds half unity, it is uſually taken as a whole number: Thus, 831′, 35″, 35‴, would be written 831′, 36.

To account for the apparent unequal motions of the planets, which they ſuppoſe to move in their reſpective orbits through equal diſtances in equal times, the *Hindus* have recourſe to excentric circles, and determine the excentricity of the orbits of the ſun and moon with reſpect to that circle, in which they place the earth as the centre of the univerſe, to be equal to the ſines of their greateſt anomaliſtic equations, and accordingly that the delineation of the path of either may be made in the following manner:

Deſcribe a circle, which divide as the ecliptic into ſigns, degrees, and minutes; note the place of the *Mandochcha*, or higher apſis, which ſuppoſe in ♉: draw a diameter to that point, and ſet off from the centre ⊕ towards the place of the apogee, the excentricity equal to the ſine of the greateſt equation, which of the ſun is 130′ 32″. Here the excentricity is repreſented much greater, that the figure may be better underſtood. Round the point E, as the centre, deſcribe the excentric circle FGHI, which is the ſun's orbit, and in the point H, where it is cut by the line ⊕ ♉ prolonged, is the place of the *Mandochcha*, or higher apſis; and in the oppoſite point F is the lower. From the place of the apogee H, ſet off its longitude in reverſe, or contrary to the order of the ſigns, for the beginning of *Aries*, and divide this

circle, as the former, into ſigns and degrees. Note the ſun's mean longitude in each circle, as ſuppoſe in *Gemini*, and from both points draw right lines to the earth at ⊕. According to the *Hindu* ſyſtem, which appears to be the ſame as the *Ptolemaic*, the angle $a \oplus C$ will be the mean anomaly, the angle $b \oplus C$ the true anomaly, and the angle $a \oplus b$ their difference, or the equation of the mean to the true place; to be ſubtracted in the firſt ſix ſigns of anomaly, and added in the laſt ſix. The *Europeans*, in the old aſtronomy, found the angle $b \oplus C$ by the following proportion, and which ſubtracted from $a \oplus C$ left the equation, which as the *Hindus*, they inſerted in tables calculated for the ſeveral degrees of the quadrant;—as the co-ſine of the mean anomaly $\oplus e = Ed$ added to the excentricity $E \oplus$, is to the ſine of the mean anomaly $ae = bd$, ſo is the radius to the tangent of the true anomaly: or, in the right angled triangle $d \oplus b$, in which are given $d \oplus$ and bd, if $d \oplus$ be made radius, bd will be the tangent of the angle $b \oplus d$, required. The *Hindus*, who have not the invention of *tangents*, take a different method, on principles equally true. They imagine the ſmall circle or epicycle, *cdef*, drawn round the planet's mean place *a* with a radius equal to the excentricity, which in this caſe, of the ſun, is 130′ 30″, and whoſe circumference in degrees, or equal diviſions of the deferent A B C D, will be in proportion as their ſemi-diameters; or, as $\oplus C = 3438'$, to A B C D $= 369°$, ſo $ag = 130' \; 32'$ to $efgd = 13° \; 40'$ which is called the *paridhi-anſa*, or *paridhi* degrees. In the ſame proportion alſo will be the correſpondent ſines *hc* and *ai* and their co-ſines *cb* and *lk*, which are therefore known by computation, in minutes or equal parts of the radius $a \oplus$, which contains, as before mentioned, 3438′. In the right angled triangle $h \oplus c$, right angled at *h*, there are given the ſides $h \oplus$ ($= a \oplus + cb$, becauſe $cb = ha$)

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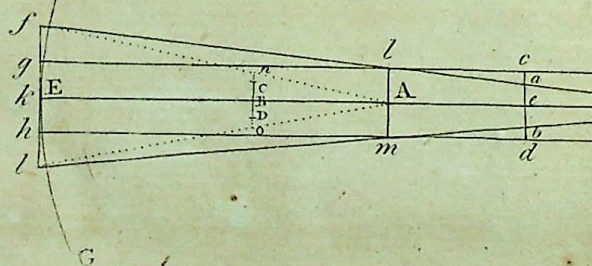
and $h\ c$; to find the hypotenuse $c\ \oplus$, by means of which the angle $a\ \oplus\ m$ may be determined; for its sine is $l\ m$, and, in the similar triangles, $c\ h\ \oplus$ and $l\ m\ \oplus$, as $c\ \oplus$ is to $m\ \oplus$, so is $h\ c$ to $l\ m$, the sine of the angle of equation. From the third to the ninth sine of anomaly, the co-sine $c\ b$ must be subtracted from the radius 3438′ for the side $h\ \oplus$.

It is, however, only in computing the retrogradations and other particulars respecting the planets *Mercury*, *Venus*, *Mars*, *Jupiter*, and *Saturn*, where circles greatly excentric are to be considered, that the *Hindus* find the length of the *carna*, or hypotenuse $c\ \oplus$; in other cases, as for the anomalistic equations of the sun and moon, they are satisfied to take hc as equal to the sine lm, their difference, as the commentator on the *Siddhanta* observes, being inconsiderable.

Upon this hypothesis are the *Hindu* tables of anomaly computed with the aid of an adjustment, which, as far as I know, may be peculiar to themselves. Finding that, in the first degree of anomaly, both from the higher and lower apsis, the difference between the mean and observed places of the planets was greater than became thus accounted for, they enlarged the epicycle in the apogee and perigee, proportionably to that observed difference for each planet respectively, conceiving it to diminish in inverse proportion to the sine of the mean anomaly, until at the distance of three sines, or half-way between those points, the radius of the epicycle should be equal to the excentricity or sine of the greatest equation. This assumed difference in the magnitude of the epicycle, they called the difference of the *paridhi ansa*, between *vishama* and *sama*; the literal meaning of which is *odd* and *even*. From the first to the third sign of anomaly, or rather in the third, a planet is in *vishama*; from the third to the

ſixth, or in the perigee, in *ſama*; in the ninth ſign, in *viſhama*; and in the twelfth, or the apogee, in *ſama*. The *paridhi* degrees, or circumference of the epicycle in *ſama* are, of the ſun 14°; in *viſhama*, 13° 40′; of the moon in *ſama* 32°; in *viſhama*, 31° 40°; the difference aſſigned to each between *ſama* and *viſhama*, 20′.

To illuſtrate theſe matters by example, let it be required to find the equation of the ſun's mean to his true place in the firſt degree of anomaly. The ſine of 1° is conſidered as equal to its arc, or 60.— The circumference of the epicycle in *ſama*, or the *apogee*, is 14°, but diminiſhing in this caſe towards *viſhama*, in inverſe proportion to the ſine of anomaly.— Therefore, as radius 3438 is to the difference between *ſama* and *viſhama* 20′, ſo is the ſine of anomaly 60′ the diminution of the epicycle in the point of anomaly

propoſed, 20″ $\left(=\frac{60' + 20'}{3438}\right)$ which, ſubtracted from 14°, leaves 13° 59′ 40″. Then, as the circumference of the great circle 360° is to the circumference of the epicycle 13° 59′ 40″, ſo is the ſine of anomaly 60′ to its correſpondent ſine in the epicycle *h c*; which, as was obſerved, is conſidered as equal to *l m*, or true ſine of the angle of equation 2′ 19″ 56‴ $\left(=\frac{13^\circ\, 59'\, 40'' + 60'}{360^\circ}\right)$, which, in the *Hindu* canon of ſines, is the ſame as its arc, and is therefore the equation of the mean to the true place in 1° of anomaly, to be added in the firſt ſix ſines, and ſubtracted in the laſt ſix.

For the equation of the mean to the true place in 5° 14′ of anomaly. The ſine of 5° 14′ is 313′ 36″ 8‴ and $\frac{313'\, 36''\, 8''' + 20, = 6272'\, 2''\, 40'''}{4438^\circ} = 1'\, 49''$, to be deducted from the *paridhi* degrees in *ſama*.—14° 1′ 49″=13° 58′ 11″, and $\frac{313', 36''\, 8''' + 13^\circ\, 58, 11'' = 4279'\, 59, 37'}{360^\circ} = 12'\, 9''\, 59'''$ the ſine of the angle of equation, which is equal to its arc.

For the ſame in 14° of anomaly. The ſine of 14°, is 831. 36.—$\frac{831' \; 36'' \times 20''}{3438,}$ = 4′ 50″, and, $\frac{14^{\circ} - 4' 50'' \times 131' 38''}{36^{\circ}}$ = 32′ 9″ the ſine of the angle of equation.

For the ſame in two ſines of anomaly. The ſine of 60° is 2978″ $\frac{2978' \times 20'}{3438}$ 17′, 19″; and $\frac{14^{\circ} - 17' \; 19'' \times 2978''}{360^{\circ}}$ = 113′ 25″ 20‴, the ſine of equation, equal to its arc.

For the equation of the mean to the true place of the moon in 1° of anomaly. The *paridhi* degrees of the moon in *ſama* are 32°, in *viſhama* 31°, 40′, the difference 20′. The ſine of 1° is 60′ and $\frac{60' \times 20''}{3438'}$ = 21″ to be deducted from the *paridhi*, degrees in *ſama*, 32° —21″ = 31° 59′ 39″. $\frac{31^{\circ}, 59', 39 + '' 60'}{360^{\circ}}$ = 5,′ 20″, the equation required.

For the ſame in ten degrees of anomaly. The ſine of 10° is 597′ $\frac{597' \times 20'}{3438}$ = 3′ 28, and $\frac{32^{\circ} - 3,' 28'' \times 597'}{390^{\circ}}$ = 52′ 28″, the equation required.

For the ſame in three ſines of anomaly. The ſine of 90° is the radius or 3438′, and $\frac{3438' \times 20'}{3438'}$ = 20′, $\frac{32^{\circ} - 20' \times 3438'}{360^{\circ}}$ = 302′, 25″ the ſine of the greateſt angle of equation, equal to the radius of the epicycle in this point of anomaly, the arc correſponding with which is 362′ 45″, the equation required.

For the equation of the mean to the true motion in theſe ſeveral points of anomaly, ſay, as radius 3438 is to the mean motion, ſo is the co-ſine *c b* of the anomaliſtic angle *g a c* in the epicycle, to the difference between the mean and apparent motion, or the equation required, to be ſubtracted from the

mean motion from the firſt three ſines of anomaly; added in the next ſix, and ſubtracted in the laſt three.

Example, for the ſun, in 5° 14′ of anomaly. The co-ſine of 5° 14′ in the *Hindu* canon is 3422′ 17″ 52‴. The *paridhi* circle in this point, found before, is 13° 58′ 11″; and $\frac{3422, 17', 50'' \times 13°, 58' \; 11''}{360°} = 132' \; 48,''$ the co-ſine *c b* in the epicycle; then, as radius 3438 is to the ſun's mean motion 59′ 8″ per day, or 59″ 8‴ per *danda*, ſo is the co-ſine *c b* = 132′ 48″, to the equation required, 2′ 17″ per day, or 2″ 17‴ per *danda*. The motion of the ſun's apſis is ſo ſlow as to be neglected in theſe calculations; but that of the moon is conſidered, in order to know her mean motion from her apogee, which is 783′ 54″.

In this manner may be determined the equation of the mean to the true anomaly and motion for each degree of the quadrant; and which will be found to agree with the tables of *Macaranda*. The following tables are tranſlated from that book:

Solar Equations, *Ravi p'hala.*

Anomaly.	Eq. of the mean to the true place.			Eq. of the mean to the true motion.		Anomaly.	Eq. of the mean to the true place			Eq. of the mean to the true motion.		Anomaly.	Eq. of the mean to the true place.			Eq. of the mean to the true motion.	
°	°	′	″	′	″	°	°	′	″	′	″	°	°	′	″	′	″
1		2	20	2	18	31	1	8	—	1	55	61	1	54	30	1	4
2		4	40	2	18	32	1	9	57	1	53	62	1	55	34	1	
3		7	—	2	18	33	1	11	57	1	53	63	1	56	35		58
4		9	19	2	17	34	1	13	47	1	51	64	1	57	34		57
5		11	37	2	17	35	1	15	40	1	51	65	1	68	34		55
6		13	56	2	17	36	1	17	32	1	49	66	1	59	30		55
7		16	15	2	16	37	1	19	23	1	47	67	2	—	23		52
8		18	33	2	16	38	1	21	11	1	45	68	2	1	14		49
9		20	51	2	15	39	1	22	57	1	43	69	2	2	4		46
10		23	7	2	14	40	1	24	42	1	42	70	2	2	51		43
11		25	23	2	14	41	1	26	26	1	40	71	2	3	35		41
12		27	39	2	13	42	1	28	7	1	38	72	2	4	17		39
13		29	55	2	13	43	1	29	46	1	36	73	2	4	57		37
14		32	10	2	12	44	1	31	23	1	34	74	2	5	35		35
15		34	24	2	11	45	1	32	58	1	32	75	2	6	12		32
16		36	37	2	11	46	2	34	32	1	30	76	2	6	45		31
17		38	39	2	10	47	1	36	4	1	29	77	2	7	17		28
18		41	1	2	9	48	1	37	35	1	28	78	2	7	45		25
19		43	12	2	8	49	1	39	6	1	28	79	2	8	12		23
20		45	22	2	7	50	1	40	36	1	26	80	2	8	36		22
21		47	31	2	6	51	1	42	3	1	23	81	2	8	58		20
22		49	39	2	6	52	1	43	26	1	19	82	2	9	18		18
23		51	47	2	5	53	1	44	45	1	16	83	2	9	36		15
24		53	53	2	3	54	1	46	2	1	14	84	2	9	51		12
25		55	57	2	2	55	1	47	17	1	13	85	2	10	3		10
26		58	1	2	1	56	1	48	33	1	13	86	2	10	13		8
27	1	—	2	2	—	57	1	49	47	1	12	87	2	10	20		6
28	1	2	53	1	58	58	1	51	—	1	11	88	2	10	27		4
29	1	4	3	1	57	59	1	52	12	1	11	89	2	10	31		1
30	1	6	2	1	56	60	1	53	25	1	8	90	2	10	33		

Lunar Equations, *Chandra p'hala.*

Anomaly.	Eq. of the mean to the true place.			Eq. of the mean to the true motion.		Anomaly.	Eq. of the mean to the true place.			Eq. of the mean to the true motion.		Anomaly.	Eq. of the mean to the true place.			Eq. of the mean to the true motion.	
°	°	′	″	′	″	°	°	′	″	′	″	°	°	′	″	′	″
1		5	20	66	39	31	2	36	37	59	20	61	4	25	26	33	41
2		10	40	69	38	32	2	41	11	58	41	62	4	27	36	32	39
3		16	—	69	33	33	2	45	36	58	—	63	4	29	59	31	35
4		21	19	69	28	34	2	49	58	57	19	64	4	32	19	30	29
5		26	36	69	21	25	2	54	20	56	37	65	4	34	37	29	22
6		31	54	69	13	36	2	58	39	55	56	66	4	36	47	28	13
7		37	12	69	4	37	3	2	54	55	14	67	4	38	54	27	7
8		42	29	68	54	38	3	7	5	54	30	68	4	40	54	26	1
9		47	44	68	43	39	3	11	12	53	44	69	4	42	50	24	55
10		52	58	68	28	40	3	15	16	52	58	70	4	44	40	23	49
11		58	11	68	11	41	3	19	18	51	26	71	4	46	24	22	42
12	1	3	23	67	52	42	3	23	24	50	57	32	4	48	5	21	34
13	1	8	40	67	35	43	3	27	26	50	48	73	4	49	38	20	24
14	1	13	45	67	17	44	3	30	34	49	46	74	4	51	9	19	14
15	1	18	53	66	55	45	3	34	39	48	54	75	4	52	53	18	3
16	1	24	—	66	38	46	3	38	21	48	—	76	4	53	54	16	51
17	1	29	5	66	18	47	3	41	58	47	5	77	4	55	6	15	38
18	1	34	9	65	57	48	3	45	32	46	9	78	4	56	15	14	25
19	1	39	10	65	36	49	3	48	59	45	13	79	4	57	17	13	14
20	1	44	9	65	14	50	3	52	24	44	19	89	4	58	13	12	3
21	1	49	17	64	50	51	3	55	46	43	27	81	4	59	6	10	53
22	1	54	3	64	24	52	3	59	2	42	32	82	4	59	53	0	41
23	1	58	3	63	56	53	4	2	13	41	37	83	5	—	27	8	34
24	1	3	47	63	24	54	4	5	18	40	41	84	5	1	8	7	14
25	2	8	35	62	53	55	4	8	18	39	44	85	5	1	40	6	2
26	2	13	22	62	22	56	4	11	16	38	47	86	5	2	3	4	51
27	2	18	6	61	48	57	4	14	11	37	50	87	5	2	20	3	40
28		22	47	61	13	58	4	17	—	36	51	88	5	2	36	2	37
29	2	27	35	60	35	59	4	19	46	35	48	89	5	2	44	1	44
30	2	32	2	59	56	60	4	22	29	34	48	90	5	2	48	—	—

Having the true longitude of the ſun and moon, and the place of the node determined by the methods explained, it is eaſy to judge, from the poſition of the latter, whether at the next conjunction or oppoſition there will be a ſolar or lunar eclipſe; in which caſe the *tit'hi*, or date of the moon's ſynodical month, muſt be computed from thence, to determine the time counted from midnight of her full or change. Her diſtance in longitude from the ſun, divided by 720, the minutes contained in a *tit'hi*, or the thirteenth part of 360°, the quotient ſhews the *tit'hi* ſhe has paſſed, and the fraction, if any, the part performed of the next; which, if it be the fifteenth, the difference between that fraction and 720′ is the diſtance ſhe has to go to her oppoſition, which will be in time proportioned to her actual motion; and that being determined, her longitude, the longitude of the ſun, and place of the node may be known for the inſtant of full moon, or middle of the lunar eclipſe. The *Hindu* method of computing theſe particulars is ſo obvious in the accompanying inſtance, as to require no further deſcription here; and the ſame may be ſaid with reſpect to the declination of the ſun and the latitude of the moon.

It is evident from what has been explained, that the *Pandits*, learned in the *Jyotiſh Saſtra*, have truer notions of the form of the earth and the economy of the univerſe than are aſcribed to the Hindus in general: and that they muſt reject the ridiculous belief of the common *Brahmas*, that eclipſes are occaſioned by the intervention of the monſter *Rahu*, with many other particulars equally unſcientific and abſurd. But, as this belief is founded on explicit and poſitive declarations contained in the *Vedas* and *Puranas*, the divine authority of which writings no devout *Hindu* can diſpute, the aſtronomers have ſome of them cautiouſly explained ſuch paſſages in thoſe writings as diſagree with the

principles of their own ſcience; and, where reconciliation was impoſſible, have apologized, as well as they could, for propoſitions neceſſarily eſtabliſhed in the practice of it, by obſerving that certain things, as ſtated in other *Saſtras*, "might have been ſo formerly, "and may be ſo ſtill; but for aſtronomical purpoſes, "aſtronomical rules muſt be followed." Others have, with a bolder ſpirit, attacked and refuted unphiloſophical opinions. *Bhaſcara* argues, that it is more reaſonable to ſuppoſe the earth to be ſelf-balanced in infinite ſpace, than that it ſhould be ſupported by a ſeries of animals, with nothing aſſignable for the laſt of them to reſt upon; And *Neraſinha*, in his commentary, ſhews that by *Rahu* and *Cetu*, the head and tail of the monſter, in the ſenſe they generally bear, could only be meant the poſition of the moon's nodes and the quantity of her latitude, on which eclipſes do certainly depend; but he does not therefore deny the reality of *Rahu* and *Cetu*: on the contrary, he ſays, that their actual exiſtence and preſence in eclipſes ought to be believed, and may be maintained as an article of faith, without any prejudice to aſtronomy. The following *Sloca*, to which a literal tranſlation is annexed, was evidently written by a *Jyotiſh*, and is well known to the *Pandits* in general:

Vip'halanyanyaſaſtrani, vivadaſteſhu cevalam:
Sap'halam jyotiſham ſaſtram, chandrarcau yatra ſacſhinau.

"Fruitleſs *are all* other *Saſtras*; in them *is* contention only. Fruitful *is* the *Jyotiſh Saſtra*, where the ſun and moon *are* two witneſſes.

The argument of *Varahaacharya* concerning the monſter *Raku*, might here be annexed, but, as this

paper will without it be ſufficiently prolix, I ſhall next proceed to ſhow how the aſtronomical *Pandits* determine the moon's diſtance and diameter, and other requiſites for the prediction of a lunar eclipſe.

The earth they conſider as ſpherical, and imagine its diameter divided into 1600 equal parts, or *Yojanas*. An ancient method of finding a circle's circumference was to multiply the diameter by three; but this being not quite enough, the *Munis* directed that it ſhould be multiplied by the ſquare root of ten. This gives for the equatorial circumference of the earth in round numbers 5059 *Yojanas*, as it is determined in the *Surya Siddhanta*. In the table of ſines, however, found in the ſame book, the radius being made to conſiſt of 3438 equal parts or minutes, of which equal parts the quadrant contains 5400, implies the knowledge of a much more accurate ratio of the diameter to the circumference; for by the firſt it is as 1. to 3. 1627. &c. by the laſt, as 1. to 3. 14136; and it is determined by the moſt approved labours of the *Europeans*, as 1. to 3. 14159, &c. In the *Puranas* the circumference of the earth is declared to be 500,000,000 *Yojans*; and, to account for this amazing difference, the commentator before quoted thought, "the *Yojan* "ſtated in the *Surya Siddhanta* contained each "100,000 of thoſe meant in the *Puranas*; or per-"haps, as ſome ſuppoſe, the earth was really of that "ſize in ſome former *Calpa*. Moreover, others ſay, "that from the equator ſouthward, the earth increa-"ſes in bulk: however, for aſtronomical purpoſes, "the dimenſions given by *Surya* muſt be aſſumed." The equatorial circumference being aſſigned, the circumference of a circle of longitude in any latitude is determined. As radius 3438 is to the *Lambajya* or ſine of the polar diſtance, equal to the complement of the latitude to ninety degrees, ſo is the equa-

torial dimenſion 5059, to the dimenſion in *Yojans* required.

Of a variety of methods for finding the latitude of a place, one is by an obſervation of the *palabha*, or ſhadow, projected from a perpendicular *Gnomon* when the ſun is in the equator. The *Sancu*, or *Gnomon*, is twelve *angulas*, or digits, in length, divided each into ſixty *vingulas*; and the ſhadow obſerved at *Benares* is $\overset{A}{5},\ \overset{V}{45}$. Then, by the proportion of a right angled triangle $\sqrt{12,^2 + 5,45.} = \overset{A}{13}\ \overset{V}{18}$, the *acſha carna* (hypotenuſe) or diſtance from the top of the *Gnomon* to the extremity of the ſhadow; which take as radius, and the projected ſhadow will be the ſine of the zenith diſtance, in this caſe, equal to the latitude of the place $\frac{3438' \times 5.45}{\overset{A}{13}\ \overset{V}{18}} = 1487$, the arc correſponding with which, in the canon of ſines, is 25° 26′, the latitude of *Benares*. The ſine complement of the latitude is 3101′ 57″, and again by trigonometry $\frac{3101'' \ 57'' + 5059 \ \overset{Y}{38}}{3438} = 4565, 4$ *Yogans* the circumference of a circle of longitude in the latitude of *Benares*.

The longitude is directed to be found by obſervation of lunar eclipſes calculated for the firſt meridian, which the *Surya Siddhanta* deſcribes as paſſing over *Lanca*, *Rohitaca*, *Avanti*, and *Sannihita-ſaras*. *Avanti* is ſaid by the commentator to be " now called *Ujjayini*," or *Ougein*, a place well known to the *Engliſh* in the *Mahratta* dominions. The diſtance of *Benares* from this meridian is ſaid to be ſixty-four *Yojans* eaſtward; and as 4565 *Yojans*, a circle of longitude at *Benares*, is to ſixty *dandas*, the natural day, ſo is ſixty-four *Yojans* to $\overset{Danda}{0},\ \overset{Pala}{50}$, the difference of longitude in time, which marks the time after midnight, when, ſtrictly ſpeaking, the aſtronomical day begins

at *Benares**. A total lunar eclipſe was obſerved to happen at *Benares* fifty-one *palas* later than a calculation gave it for *Lanca*, and $\frac{51 + 4565\ 4}{60}$ = ſixty - four *Yojana*, the difference of longitude on the earth's ſurface.

According to *Rennel*'s map, in which may be found *Ougein*, and agreeably to the longitude aſſigned to *Benares*, the equinoctial point *Lanca* falls in the Eaſtern Ocean, ſouthward from *Ceylon* and the *Maldiva* Iſlands. *Lanca* is fabulouſly repreſented as one of four cities built by *Devatas*, at equal diſtances from each other, and alſo from *Sumeru* and *Badawanal*, the north and ſouth poles, whoſe walls are of gold, &c. and with reſpect to *Meya*'s performing his famous devotions, in reward of which he received the aſtronomical revelations from the ſun, recorded in the *Surya Siddhanta*, the commentator obſerves, " he performed " thoſe devotions in *Salmala*, a country a little to the " eaſtward of *Lanca*: the dimenſions of *Lanca* are " equal to one twelfth part of the equatorial circumfe- " rence of the earth," &c. Hence, perhaps on inquiry, may be found whether by *Salmala* is not meant *Ceylon*. In the hiſtory of the war of *Rama* with *Rawan*, the tyrant of *Lanca*, the latter is ſaid to have married the daughter of an *Aſura*, named *Meya*: but theſe diſquiſitions are foreign to my purpoſe.

For the dimenſions of the moon's *cacſha* (orbit) the rule in the *Sanſcrit* text is more particular than is neceſſary to be explained to any perſon who has informed

* " This day (*aſtronomical day*) is accounted to begin at mid- " night, under the *rec'ha* (meridian) of *Lanca*; and at all places " eaſt or weſt of that meridian, as much ſooner or later as is their " *deſantera* (longitude) reduced to time, according to the *Surya* " *Siddhanta*, *Brahma Siddhanta*, *Vaſiſhtha Siddhanta*, *Soma Siddhanta*, *Paraſero Siddhanta*, and *Aryabhatta*. According to *Brahmagupta* and others, it begins at ſunriſe; according to the *Ramaca* and others, it begins at noon; and according to the *Arſha* " *Siddhanta*, at ſunſet." (*Tica* on the *Surya Siddhanta*).

himſelf of the methods uſed by *European* aſtronomers to determine the moon's horizontal parallax. In general terms, it is to obſerve the moon's altitude, and thence, with other requiſites, to compute the time and her aſcenſion from the ſenſible *cſhitija*, or horizon, and her diſtance from the ſun when upon the rational horizon, by which, to find the time of her paſſage from the one point to the other; or, in other words, 'to 'find the difference in time between the meridian to 'which the eye referred at her riſing, and the meridian 'ſhe was actually upon;' in which difference of time ſhe will have paſſed through a ſpace equal to the earth's ſemidiameter or 800 *Yojan*: and by proportion, as that time is to her periodical month, ſo is 800 *Yojan* to the circumference of her *cacſha*, 324000 *Yojan*. The errors ariſing from refraction, and their taking the moon's motion as along the ſine inſtead of its arc, may here be remarked; but it does not ſeem that they had any idea of the firſt*; and the latter they perhaps thought too inconſiderable to be noticed. Hence it appears that they made the horizontal parallax 53′ 20″, and her diſtance from the earth's centre 51570 *Yojan*; for $\frac{180^\circ \times 1600}{324000} = 53' \; 20''$; and as 90° or 5400′ is to the radius 3438, ſo is one-fourth of her orbit 81000 *Yojan* to 51570, and $\frac{51570 \times 21600}{5059} = 220184$, the ſame diſtance in geographical miles. *European* aſtronomers compute the mean diſtance of the moon about 240000, which is ſomething above a fifteenth part more than the *Hindus* found it ſo long ago as the time of *Meya*, the author of the *Surya Siddhanta*.

By the *Hindu* ſyſtem the planets are ſuppoſed to move in their reſpective orbits at the ſame rate; the dimenſions therefore of the moon's orbit being

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* But they are not wholly ignorant of optics: they known the angles of *incidence* and *reflection* to be equal, and compute the place of a ſtar or planet, as it would be ſeen reflected from water or a mirror.

known, thoſe of the other planets are determined, according to their periodical revolutions, by proportion. As the ſun's revolutions in a *Maha Yug* 4320000 are to the moon's revolutions in the ſame cycle 57533336, ſo is her orbit 324000 *Yojan* to the ſun's orbit 4331500 *Yojan*; and in the ſame manner for the *cacſhas*, or orbits, of the other planets. All true diſtance and magnitude derivable from parallax, is here out of the queſtion; but the *Hindu* hypotheſis will be found to anſwer their purpoſe in determining the duration of eclipſes, &c.

For the diameters of the ſun and moon, it is directed to obſerve the time between the appearance of the limb upon the horizon and the inſtant of the whole diſk being riſen, when their apparent motion is at a mean rate, or when in three ſigns of anomaly; then, by proportion, as that time is to a natural day, ſo are their orbits to their diameters reſpectively; which of the ſun is 6500 *Yojan*; of the moon, 480 *Yojan*. Theſe dimenſions are increaſed or diminiſhed as they approach the lower or higher apſis, in proportion as their apparent motion exceeds or falls ſhort of the mean, for the purpoſe of computing the diameter of the earth's ſhadow at the moon, on principles which may perhaps be made more intelligible by a figure.

Let the earth's diameter be $lm=gh=cd$; the diſtance of the moon from the earth AB, and her diameter CD. By this ſyſtem, which ſuppoſes all the planets moving at the ſame rate, the dimenſions of the ſun's orbit will exceed the moon's, in proportion as his period in time exceeds hers; let his diſtance be AE, and EFG part of his orbit. According to the foregoing computation alſo, the ſun's apparent diameter fi, at this diſtance from the earth, is 6500 *Yojan*; or rather, the angle his diameter ſubtends when viewed in three ſigns of anomaly, would be 6500 parts of the

circumference of a circle consisting of 4331500, and described round the earth as a centre with a radius equal to his mean distance, which is properly all that is meant by the *vishcambha*, and which, therefore, is increased or diminished according to his equated motion. This in three signs of anomaly is equivalent to 32′ 24″; for, as 4331500 to 360°, so 6500 to 32′ 24″. The *Europeans* determine the same to be 32′ 22″. In the same manner, the sun's *vishcambha* in the mean *cacsha* of the moon, or the portion of her orbit in *Yojans*, included in this angle, is found, as 4331500 is to 324000, so is 6500 to 486 *Yojan* or *n*, *o*, of use in solar eclipses; but this I am endeavouring to explain is a lunar one. It is evident that the diameter of the earth's shadow at the moon will be *c*, *d*,—*c*, $a+b$, *d*, or *a b* when her distance is *A e*; and that *c a* and *b d* will be found by the following proportion: as *A k* is to $f\,i - g\,h = f\,g + h\,i$, so is *A e* to $c\,a + b\,d$. But it has been observed that *A k* and *f i* are proportioned by the *Hindus* according to the moon's distance *A e*, the apparent motion of the sun and moon, and the angles subtended by their diameters. The *Hindu* rule therefore states, As the sun's *vishcambha* or diameter is to the moon's, so is the difference of the diameters of the sun and earth, in *Yojans*, to a fourth number, equal to $c\,a + b\,d$ to be subtracted from the *suchi*, or $lm = cd$ to find *a b*; also, that the number of *Yojans*, thus determined as the diameters of the moon and shadow, may be reduced to minutes of a great circle by a division of fifteen. For, as the minutes contained in 360° = 21600, are to the moon's orbit in *Yojan* 324000, so is one minute to fifteen *Yojan*.

The diameter of the moon's disk, of the earth's shadow, and the place of the node being found for the instant of opposition or full moon, the remaining

part of the operation differs in no respect that I know of from the method of *European* astronomers to compute a lunar eclipse. The translation of the Formula for this purpose, in the *Surya Siddhanta*, is as follows: "The earth's shadow is always six signs "distant from *Surya*; and *Chandra* is eclipsed whenever at the *purnima* the *pata* is found there; as is "also *Surya*, whenever at the end of the *amavasya* the "*pata* is found in the place of *Surya*; or, in either "case, when the *pata* is nearly so situated. At the "end of the *amavasya tit'hi* the signs, degrees, "and minutes of *Surya* and *Chandra* are equal; and "at the end of the *purnima tit'hi*, the difference is exactly six signs; take therefore the time unexpired "of either of those *tit'his*, and the motion for that "time add to the *madhyama*, and the degrees and minutes of *Surya* and *Chandra* will be equal. For "the same instants of time compute the place of the "*pata* in its retrograde motion, and, if it should be in "conjunction with *Surya* and *Chandra*, then, as from "the intervention of a cloud, there will be an obscurity of *Surya* or of *Chandra*. *Chandra*, from the "west, approaches from the earth's shadow, which on "entering, he is obscured. For the instant of the *purinima*, from the half sum of the *chandramana* and the "*tamoliptamana* subtract the *vicshepa*, the remainder is "the *ch'channa*. If the *ch'channa* is greater* than the "*grahyamana*, the eclipse will be total; and if less, the "eclipse will be proportionably less. The *grahya* and "*grahaca* deduct and also add; square the difference "and the sum severally; subtract the square of the "*vicshepa* from each of those squares, and the square "root of each remainder multiply by sixty; divide "each product by the difference of the *gati* of *Surya*

* Or, when the *ch'channa* and *grahyamana* are equal, the eclipse is *total*.

" and *Chandra*; the first quotient will be half the
" duration of the eclipse in *dandas* and *palas*; and the
" second quotient will be half the *vimardardha* dura-
" tion in *dandas* and *palas*," &c. The *ch'channa*, or portion of the disk eclipsed, is here found in degrees and minutes of a great circle: it may also be estimated in *digits*; but the *angulas* or digits of the *Hindus* are of various dimensions in different books.

The beginning, middle, and end of the eclipse may now be supposed found for the time in *Hindu*-hours, when it will happen after midnight; but, for the corresponding hour of the civil day, which begins at sunrise, it is further necessary to compute the length of the artificial day and night; and, for this purpose, must be known the *ayanansa* or distance of the vernal equinox from the first of *mesha*, the sun's right ascension and declination; which several requisites shall be mentioned in their order.

Respecting the precession of the equinoxes and place of the colure, the following is a translation of all I can find on the subject in the *Surya Siddhanta* and its commentary:—

Text. "The *ayanansa* moves eastward thirty times
" twenty in each *Maha Yug*; by that number (600)
" multiply *ahargana* (number of mean solar days
" for which the calculation is made) and divide the
" product by the *savan* days in a *Yug*, and of the quo-
" tient take the *bhuja*, which multiply by three, and
" divide the product by ten; the quotient is the *ayan-*
" *ansa*. With the *ayanansa* correct the *graha*, *cranti*,
" the *ch'haya*, *charadala*, and other requisites to find
" the *pushti* and the two *vishuvas*. When the *carna*
" is less than *surya ch'haya*, the *pracchacra* moves

" eaſtward, and the *ayananſa* muſt be added; and
" when more, it moves weſtward, and the *ayananſa*
" muſt be ſubtracted.

Commentary. " By the text, the *ayana bhagana* is
" underſtood to conſiſt of 600 *bhaganas* (periods) in
" a *Maha Yug*; but ſome perſons ſay, the meaning is
" thirty *bhaganas* only, and accordingly that there
" are 30,000 *bhaganas*. Alſo that *Bhaſcar Acharya*
" obſerves, that, agreeably to what has been delivered
" by *Surya*, there are 30,000 *bhaganas* of the *ayananſa*
" in a *Calpa*. This is erroneous; for it diſagrees
" with the *Saſtras* of the *Riſhis*. The *Sacalya San-*
" *hita* ſtates that the *bhaganas* of the *Cranti pata* in
" a *Maha Yug* are 600 eaſtward. The ſame is ob-
" ſerved in the *Vaſiſht'ha Siddhanta*; and the rule
" for determining the *ayananſa* is as follows:—The
" expired years divided by 600, of the quotient make
" the *bhuja*, which multiply by three, and divide the
" product by ten. The meaning of *Bhaſcar Acha-*
" *rya* was not, that *Surya* gave 30,000 as the *bhaganas*
" of the *ayananſa* in a *Calpa*, the name he uſed being
" *Saura* not *Surya*, and applied to ſome other book.
" From the *natanſa* is known the *crantyanſa*, and
" from the *crantijya* the *bhujajya*, the arc of which
" is the *bhujanſa* of *Surya*, including the *ayananſa*:
" this for the firſt three months; after which, for
" the next three months, the place of *Surya*, found by
" this mode of calculation, muſt be deducted from
" ſix ſigns. For the next three months the place of
" *Surya* muſt be added to ſix ſigns, and for the laſt
" three months the place of *Surya* muſt be deducted
" from twelve ſigns. Thus, from the ſhadow may
" be computed the true place of *Surya*. For the
" ſame inſtant of time compute his place by the
" *ahargana*, from which will appear whether the
" *ayananſa* is to be added or ſubtracted. If the place
" found by the *ahargana* be leſs than the place

" found by the ſhadow, the *ayananſa* muſt be added.
" In the preſent time the *ayananſa* is added. Ac-
" cording to the author of the *Varaſanhita*, it was
" ſaid to have been formerly deducted *; and the
" ſouthern *ayana* of *Surya* to have been in the firſt
" half of the *nacſhatra Aſleſha* †; and the northern
" *ayana* in the beginning of *Dhaniſhta*: that in his
" time the ſouthern *ayana* was in the beginning of
" *Cacara*, or Cancer; and the northern in the be-
" ginning of *Macara*, or Capricorn.

" The *bhaganas* of the *ayananſa* in a *Maha Yug* are
" 600, the *ſaura* years in the ſame period 4,320,000;
" one *bhagana* of the *ayananſa* therefore contains
" 7,200 years. Of a *bhagana* there are four *padas*:
" *Firſt pada*, when there was no *ayananſa*; but the
" *ayananſa* beginning from that time and increaſing,
" it was added. It continued increaſing 1800 years;
" when it became at its utmoſt, or twenty-ſeven de-
" grees. *Second pada*:—After this it diminiſhed;

---

* It was ſaid to have been formerly *rina*." In the *Hindu* ſpecious arithmetic, or algebra, *ahana* ſignifies affirmation or addition, and *rina* negation or ſubtraction: the ſign of the latter is a point placed over the figure, or the quantity noted down: thus, four added to ſeven, is equal to three. See the *Bija Ganita*, where the mode of computation is explained thus: "When a man has four pieces of money, and owes ſeven of the ſame value, his circumſtances reduced to the form of an equation, or his books balanced, ſhow a deficiency of three pieces."

† This deſcribes the place of the ſolſticial colure; and, according to this account of the *ayananſa*, the equinoctial colure muſt then have paſſed through the tenth degree of the *nacſhatra Bharani* and the 3° 20′ of *Viſac'ha*. The circumſtance, as it is mentioned in *Vana Sanhita*, is curious and deſerving of notice. I ſhall only obſerve here, that, although it does not diſagree with the preſent ſyſtem of the *Hindus* in regard to the motion of the equinoctial points, yet the commentator on the *Varaſanhita* ſuppoſes that it muſt have been owing to ſome preternatural cauſe. The place here deſcribed of the colure, is on compariſon of the *Hindu* and *European* ſpheres about 3° 40′ eaſtward of the poſition, which it is ſuppoſed by Sir *Iſaac Newton*, on the authority of *Eudoxus*, to have had in the *primitive* ſphere at the time of the Argonautic expedition.

" but the amount was still added, until, at the end
" of 1800 years more, it was diminished to nothing.
" *Third pada:* The *ayanansa* for the next 1800 years
" was deducted; and the amount deducted at the
" end of that term was twenty-seven degrees. *Fourth*
" *pada:* The amount deduction diminished; and at
" the end of the next term of 1800 years, there was
" nothing either added or subtracted. The *Munis*,
" having observed these circumstances, gave rules ac-
" cordingly: if in the *savan* days of a *Maha Yug*
" there are 600 *bhaganas*, what will be found in the
" *ahargana* proposed? which statement will produce
" *bhaganas*, sines, &c.; reject the *bhaganas*, and
" take the *bhuja* of the remainder, which multiply
" by three and divide by ten, because there are four
" *padas* in the *bhagana*; for if in 90° there is a cer-
" tain number found as the *bhuja*, when the *bhuja*
" degrees are twenty-seven, what will be found?
" and the numbers twenty-seven and ninety used in
" the computation being in the ratio of three to ten,
" the latter are used to save trouble.

" There is another method of computing the *aya-*
" *nansa:* The *cranti-pata-gati* is taken at one minute
" per year; and according to this rule the *ayanansa*
" increases to twenty-four degrees; the time neces-
" sary for which, as *one pada* is 1440 years. This is
" the *gati* of the *nacshatras* of the *cranti mandala*.

" The *nacshatra Revati* rises where the *nari man-*
" *dala* and the *cshitija* intersect*; but it has been

* This can happen only when there is no *ayanansa*. The *nari* *mandala* is the equator. This *yoga* star of *Revati* is in the last of *Mina* (Pisces) or, which is the same, in the *first* of *Mesha* (Aries) and has no latitude in the *Hindu* tables. Hence, from the *ayan-* *ansa* and time of the beginning of the *Hindu* year, may be known their zodiacal stars. *Revati* is the name of the twenty-seventh *lunar* mansion, which comprehends the last 13° 20′ of *Mina*. When the *ayanansa* was 0, as at the creation, the beginning of the

"observed to vary twenty-seven degrees north and
"south. The same variation is observed in the other
"*nacshatras*: it is therefore rightly said, that the
"*chacra* moves eastward. The *chacra* means all the
"*nacshatras*, and the *cranti-pati-gati* is owing to
"them, not to the planets; and hence it is observed
"in the text, that the *pata* draws *chandra* to a dis-
"tance equal to the *cranti* degrees."

Here, to my apprehension, instead of a revolution of the equinoxes through all the signs in the course of the *Platonic* year, which would carry the first of *Vaisac'h* through all the seasons, is clearly implied a libration of those points from the third degree of *Pisces* to the twenty-seventh of *Aries*, and from the third of *Virgo* to the twenty-seventh of *Libra*, and back again in 7200 years; but, as this must seem to *Europeans* an extraordinary circumstance to be stated in so ancient a treatise as the *Surya Siddhanta*, and believed by *Hindu* astronomers ever since, I hope the above quotations may attract the attention of those who are qualified for a critical examination of them, and be compared with whatever is to be found in other *Sastras*, on the same subject. Whatever may be the result of such an investigation, there is no mistaking the rule for determining the *ayanansa*, which was at the beginning of the present year 19° 21′, and consequently the vernal equinox in *Pisces* 10° 39′ of the *Hindu* sphere; or, in other words, the sun entered *Mesha* or *Aries*, and the *Hindu* year began when he was advanced 19° 21′ into the northern signs, according to *European* expression.

Cali Yug, &c. the colure passed through the *yoga* star of *Revati*. It is plain, that in this passage *Revati* applies either to the particular *yoga* star of that name, or to the last, or twenty-seventh *lunar* mansion, in which it is situated. (See a former note.) In each *nacshatra*, or planetary mansion, there is *one* star called the *yoga*, whose latitude, longitude, and right ascension, the *Hindus* have determined and inserted in their astronomical tables.

The *ayananſa* added to the ſun's longitude in the *Hindu* ſphere, gives his diſtance from the vernal equinox: of the ſum take the *bhuja*; that is, if it exceeds three ſines, ſubtract ſix from it; and if it exceeds nine ſines, ſubtract it from twelve. The quantity ſo found will be the ſun's diſtance from the neareſt equinoctial point from which is found his declination—as radius is to the *paramapacramajya*, or ſine of the greateſt declination 24°, ſo is the ſun's diſtance from the neareſt equinoctial point to the declination ſought; which will agree with the table of declination in preſent uſe, to be found in the tables of *Macaranda*, and calculated for the ſeveral degrees of the quadrant. The declination thus determined for one ſign, two ſigns, and three ſines, 11° 43′, 20° 38′, and the greateſt declination, or the angle of inclination of the ecliptic and equator 24°. The co-ſines of the ſame in the *Hindu* canon are 3366′, 3217′ and 3141′; and as the co-ſine of the declination for one ſine, is the co-ſine of the greateſt declination, ſo is the ſine of 30° to the ſine of the right aſcenſion for a point of the ecliptic at that diſtance from either of the two *viſhuvas*, or equinoctial points. In this manner is found the right aſcenſion for the twelve ſigns of the ecliptic, reckoned from the vernal equinox; and alſo, by the ſame management of triangles, the aſcenſional difference and oblique aſcenſion for any latitude: which ſeveral particulars are inſerted in the *Hindu* books, as in the following table, which is calculated for *Bhagalpur*, on ſuppo-

A V

ſition that the *palabha* or equinoctial ſhadow is 5 30. By the *Lagna* of *Lanca*, *Madhyama*, or mean *Lagna*, the *Hindus* mean thoſe points of the equator which riſe reſpectively with each thirtieth degree of the ecliptic counted from *Aries* in a right ſphere, anſwering to the right aſcenſion in any latitude; by the *Lagna* of a particular place, the oblique aſcenſion, or the diviſions of the equator which riſe in ſucceſſion with each ſign in an oblique ſphere, and by the *chara* the aſcenſional difference.

Signs.	Lagna of Lanca.		Chara of Bhagalpur.		Ullagna.	
Hindu Names.	In respirations answering to minutes of the equator.	In palas, or minutes of time, 3600 to a Nacshatra day.	In respirations answering to minutes of the equator.	In palas, or minutes of time, 3600 to a Nacshatra day.	In respirations answering to minutes of the equator.	In palas, or minutes of time, 4600 to a Nacshatra day.
Mesha,	1670	278	327	55	1343	224
Vrisha,	1795	299	268	45	1527	255
Mit'huna,	1935	323	110	18	1825	304
Carcata,	1935	323	110	18	2045	341
Sinha,	1795	299	268	45	2063	343
Canya,	1670	278	327	55	1997	333
Tula,	1670	278	327	55	1997	333
Vrischica,	1795	299	268	45	2063	343
Dhanus,	1935	323	110	18	2045	341
Macara,	1935	323	110	18	1825	304
Cumbha,	1735	299	268	45	1527	255
Mina.	1670	278	327	55	1343	224
	21600	3600			21600	3600
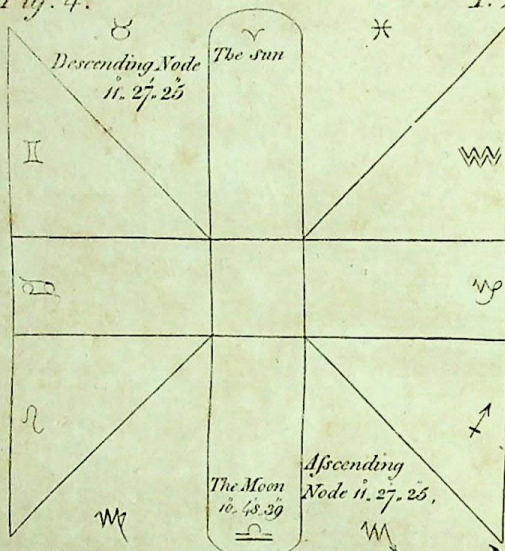
Fig. 4.
Vol, 2.
P. 273.
The Sun
Descending Node
11. 27. 25
The Moon
10. 48. 39
Ascending
Node 11. 27. 25.
瞻彼淇澳菉竹猗猗
有斐君子如切如磋
如琢如磨瑟兮僩兮
赫兮咺兮有斐君子
終不可諠
A Chinese Ode. P. 199.

COMPUTATION OF THE ECLIPSE.

Let it be premiſed that the poſition of the ſun, moon, and nodes, by calculation, will on the firſt of next *Vaiſac'h* be as here repreſented in the *Hindu* manner, excepting the characters of the ſigns.

By inſpection of the figure, and by conſidering the motion of the ſun, moon, and nodes, it appears that, when the ſun comes to the ſign *Tula* (*Libra*) correſponding with the month of *Cartic*, the deſcending node will have gone back to *Aries*; and that conſequently a *lunar* eclipſe may be expected to happen at the end of the *purnima tit'hi*, or time of full moon, in that month.

FIRST OPERATION.

To find the number of mean ſolar days from the creation to ſome part of the *purnima tit'hi* in *Cartic*, of the 4891ſt year of the *Cali Yug*.

Years expired of the *Calpa* to the end of the *Satya Yug*, - - - -	1970784000
Deduct the term of *Brahma*'s employment in the creation, - -	17064000
From the creation, when the planetary motions began, to the end of the *Satya Yug*, - - -	1953720000
Add the *Treta Yug*, - -	1296000
Dwaper Yug, - -	864000
Preſent year of the *Cali Yug*,	4890
From the creation to the next approaching *Bengal year*, - -	1955884890
Or ſolar months, (× 12) - -	23470618680
Add ſeven months, - -	72
	23470618680

As the ſolar months in a *Yug*, 51840000, are to the intercalary *lunar* months in that cycle, 1593336, ſo are the ſolar months 23470618687, to their correſponding intercalary *lunar* months 721384677; which added together, give 24192003364 lunations. This number multiplied by thirty, produces 725760100920 *tit'his*, or lunar days, from the creation to the new moon in *Cartic*; to which add fourteen *tit'his* for the ſame, to the *purnima tit'his* in that month 725760100934. Then, as the number of *tit'his* in a *Yug*, 1603000080, is to their difference exceeding the mean ſolar days in that cycle (called *eſchaya tit'his*) 25082252, ſo are 725760100934 *tit'his* to their exceſs in number over the ſolar days 11356017987, which ſubtracted, leaves 714404082947, as the number of mean ſolar days from the creation, or when the planetary motions began, to a point of time which will be midnight under the firſt meridian of *Lanca*, and near the time of full moon in *Cartic**. The firſt day after the creation being *Ravi-var*, or *Sunday*, divide the number of days by ſeven for the day of the week, the remainder after the diviſion being two, marks the day *Soma-var*, or *Monday*.

SECOND OPERATION.

For the mean longitude of the ſun, moon, and the aſcending node. Say, as the number of mean ſolar days in a *Maha Yug* is to the revolutions of any planet in that cycle, ſo are the days from the creation to even revolutions, which reject, and the fraction, if any, turned into ſines, &c. is the mean longitude required.

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* In the year of the *Cali Yug* 4891, correſponding with 1196 *Bengal* ſtyle, and with the month of *October* or *November* (hereafter to be determined) in the year of *Chriſt* 1789.

1st. *Of the Sun.*

		Revolutions.	Sines.	°	′	″	‴
$\frac{714404082947 \times 4320000}{1577917828}$	=	(1955884890)	6	22	44	2	12

2d. *Of the Moon.*

$$\frac{714404082947 \times 57753336}{1577917828} = (26147888255)\ 0\ 21\ 21\ 58\ 56$$

3d. *Of the Moon's Apogee.*

$$\frac{714404082947 \times 488203}{1577917828} = (221034460)\ 11\ 5\ 31\ 13\ 35$$

Correction of the Bija add.

$$\frac{714404082947 \times 4}{1577917828} = (---)\ 0\ 37\ 37\ 52\ 28$$

11 7 9 6 3

4th. *Of the Moon's Ascending Node.*

$$\frac{714404082947 \times 232238}{1577917828} = (105147017)\ 4\ 27\ 49\ 48\ -$$

Correction of the Bija add.

$$\frac{714404082947 \times 4}{1577917828} = (---)\ 0\ 1\ 37\ 52\ 28$$

4 29 27 40 28

5th. *Of the Sun's Apogee.*

$$\frac{714404082947 \times 387}{1577917828}\ (-175-)\ 2\ 17\ 17\ 15\ -$$

	Mean longitude for midnight under the meridian of Lanca.	Deduct for the longitude of Bhagalpur as * 80° 50′ of equator east.	Mean longitude for midnight at Bhagalpur.
	s ° ′ ″ ‴	′ ″	
Of the Sun, —	6 21 44 2 12	1 27	6 21 42 35 12
Moon, —	— 21 21 58 56	19 34	— 21 2 25 —
Node, —	4 29 27 40 28	— 4	4 29 27 36 —
Sun's Apogee,	2 17 17 15 —	inconfiderable	2 17 17 16 —
Moon's Apogee,	11 7 9 6 3	— 9	11 7 8 57 —

THIRD OPERATION.

For the equated longitude of the Sun and Moon, &c.

1ſt. *Of the Sun.*

The mean longitude of the ſun is 6 21° 42′ 35″ 12‴; of the apogee 2 17 17 15, the difference, or mean anomaly, $4^s\ 4^\circ\ 25'\ 20''$; its complement to 6 ſines or diſtance from the perigee $1^s\ 25^\circ\ 34'\ 40''$, the equation for which is required. This may either be taken from the foregoing table, tranſlated from *Macaranda*, or calculated in the manner explained as follows:

The ſine of $1^s\ 25^\circ\ 34'\ 40''$ is $2835'\ 31''$ and $\frac{2835'31''\times 20'}{3438}$ $= 14'\ 30''$ to be ſubtracted from the *paridhi* degrees in *ſama*; $14^\circ - 14'\ 30'' = 13^\circ\ 53'\ 30''$, the circumference of epicycle in this point of anomaly; and $\frac{13^\circ 43'30''\times 2835'\ 31''}{360^\circ} = 108'\ 61''$ the ſine of the angle of equation, conſidered as equal to its arc, or $1^\circ\ 48\ 6''$, to be deducted from the mean, for the true longitude;

* This longitude, aſſigned to *Bhagalpur*, is erroneous; but the error does not in the leaſt affect the main object of the paper.

$6^s\ 21^\circ\ 42\ 35''—1^\circ\ 48'\ 6''=6^s\ 19^\circ\ 54'\ 29'$ for midnight agreeing with mean time; but as, in this point of anomaly, the true or apparent midnight precedes that eſtimated for mean time, for which the computation has been made, a proportionable quantity muſt be deducted from the ſun's place, which is thus found: Say, as the minutes contained in the ecliptic are to the ſun's mean motion in one day $59'\ 8''$, ſo is the equation of his mean to his true place $180'\ 6''$, to the equation of time required, $0'\ 18''$ $\left(=\frac{59'\ 8'' \times 108'\ 6''}{21600}\right)$ and $6^s\ 19^\circ\ 54'\ 29''—29''—18''=6^s\ 19^\circ\ 54'\ 11''$ the ſun's true longitude for the apparent midnight.

For the ſun's true motion. The co-ſine of the ſun's diſtance from the perigee is $1941'\ 0''\ 1'''$, and $\frac{1941'0''\ 1''' \times 13\ 43\ 30}{360^\circ}=74'$ the co-ſine of the epicycle, and $\frac{59'8'' \times 74}{3438}=1'\ 16''$ equation, to be added to the mean for the true motion, $59'\ 8'' \times 1'\ 16''=60''\ 24''$ per day, or $60''\ 23'''$ per *danda*.

2d. *Of the Moon.*

The moon's mean longitude for the mean midnight is $0^s\ 20^\circ\ 2'\ 25'$, which exceeds her mean longitude for the true midnight, but $\frac{108 \times 790\ 1\ 35}{21600}=3'\ 57'$, her motion in the difference of time between the mean and true midnight $0^s\ 21^\circ\ 2'\ 25''—3'\ 57'=0\ 20\ 58$ 28 mean longitude, for which the anomaliſtic equation is to be found. Place of the apogee $11^s\ 7^\circ\ 8''\ 55''$ and the moon's diſtance from it $1^s\ 13^\circ\ 49'\ 33''$. The ſine of the latter, $2379'\ 39''$. By the rule before explained $\frac{2379'\ 39'' \times 20'}{3438}=13'\ 51''$, and $\frac{32^\circ—13'\ 51'' \times 2379'39''}{360}$ $=210'$ the ſine of the angle of equation equal to its arc, or $3^\circ\ 30''$ to be ſubtracted, $0^\circ\ 20'\ 58''\ 28''—3^\circ\ 30=0^\circ\ 17'\ 28''\ 28'''$ the moon's true place, agreeing with the true apparent midnight.

For the moon's true motion. The co-fine of her diftance from the apogee 2479. 13. Circumference of the epicycle 31° 46′ 9″, and $\frac{31° 46' 9'' \times 2479' 13''}{360°}$ = 218′ 47″ co-fine in the epicycle. The moon's mean motion from her apogee is 790′ 35″—6′ 41″=783′ 54′, and $\frac{783' 54'' \times 218' 47''}{3838'}$ = 49′ 53″ the equation of her mean to her true motion, to be fubtracted, 790. 35—49 53 = 740. 42 the moon's true motion per day, or 740′ 42‴ per *danda*.

For the place of the moon's apogee reduced to the apparent midnight. The motion of the apogee is 6′ 41″ per day, $\frac{108' 6'' \times 6' 11''}{21600'}$ = 2″, 11ˢ 7° 8′ 57″ — 2″ = 11ˢ 7° 8′ 55″ its place.

For the fame of the node. Its motion per day is 3′ 11″, and $\frac{108' 6' \times 3'' 11''}{21600}$ = 1″, and 4ˢ 29° 27′ 36″—1″ = 4ˢ 29° 27′ 35″ its placer

The true longitude and motion, therefore, for the apparent time of midnight at *Bhagalpur*, 714404082947 folar days after the creation, or commencement of the planetary motions, will be

	Longitude.				Motion per day.	
	s	°	′	″	′	″
Of the Sun,	6	19	54	11	60	24
Moon,	—	17	28	28	740	42
Sun's Apogee,	2	17	17	15	inconfiderable	
Moon's Apogee,	11	7	8	55	6	41
Moon's Node,	4	29	27	35	3	11

SECOND OPERATION.

Having the longitude and motion as above, to determine the *tit'hi* and time remaining unexpired to the inftant of oppofition, or full moon.

The moon's longitude ſubtracted from the ſun's, leaves $5^s\ 27^\circ\ 34''\ 17''$, or $10654'\ 17''$, which, divided by $720'$ the minutes in a mean *tit'hi*, quotes fourteen even *tit'his* expired, and the fraction, or remainder $574'\ 17''$, is the portion expired of the 15th, or *purnima tit'hi*, which ſubtracted from $720'$, leaves $145'\ 43''$ remaining unexpired of the ſame; which, divided by the moon's motion per *danda* from the ſun, will give the time remaining unexpired from midnight to the inſtant of the full moon with as much preciſion as the *Hindu* aſtronomy requires. Deduct the ſun's motion $60''\ 24'''$ per *danda* from the moon's $740''\ 42'''$, the remainder $680''\ 8'''$, is the moon's motion from the ſun; by this divide the part remaining unexpired of the *purnima tit'hi* $145''\ 43''$.

$$\frac{145'\ 43'' = 524580'''}{680''\ 8''' = 40818'''} = \overset{D.}{12}\ \overset{P.}{51}$$

therefore 12 *dandas*, 51 *palas* after midnight will be the end of the *purnima tit'hi*, or inſtant of oppoſition of the ſun and moon.

FIFTH OPERATION.

Having the inſtant of oppoſition as above, to find the true longitude and motion of the ſun and moon, the latitude of the latter, and the place of the node.

Add the mean motion of each for $\overset{D.}{12}\ \overset{P.}{51}$ to the mean place, found before for the true midnight; and for the mean places ſo found, compute again the anomaliſtic equations. This being but a repetition of operation, the third is unneceſſary to be detailed. The ſeveral particulars are as follows:

	Mean longitude for midnight.	Mean longitude at full moon.	Equation.	True longitude at full moon.
	s ° ′ ″	s ° ′ ″	° ′ ″	s ° ′ ″
Of the Sun,	6 21 42 17	6 21 54 17	1 47 50	6 20 7 7
Moon,	— 20 58 28	— 23 47 47	3 40 20	— 20 7 27
Moon's Apogee,	11 7 8 55	11 7 10 21	———	———
Moon's Node,	4 29 27 35	4 29 28 16	———	———

	Mean motion.	Equation.	True motion at full moon.
Of the Sun,	59′ 8″	× 1′ 16″	60′ 24″
Moon,	790 35	— 47 28	743 7

Hence it appears that, at the oppoſition, the moon will be near her deſcending node; for, $4^s\ 29°\ 28'\ 17'' \times 6^s = 10^s\ 29°\ 28'\ 16''$, the place of the deſcending node *in antecedentia*, and $12^s - 10^s\ 29°\ 28'\ 16'' = 1^s\ 0°\ 31'\ 44''$ its longitude according to the order of the ſigns, and $1^s\ 0°\ 31'\ 44' - 20°\ 7'\ 27'' = 10°\ 24'\ 17''$ the moon's diſtance from her deſcending node, which, being within the limit of a lunar eclipſe, ſhows that the moon will be then eclipſed. For her latitude at this time, ſay, as radius is to the inclination of her orbit to the ecliptic, $4°\ 30'$ or $270'$, ſo is the ſine of her diſtance from the node $620'\ 57''$, to her latitude of $48'\ 45''$ $\left(= \frac{279'' \times 620'\ 57''}{3438'}\right)$.

SIXTH OPERATION.

From the elements now found, to compute the diameter of the moon and ſhadow, and the duration of the eclipſe.

		Yojan.
The Sun's mean diameter is		6500
Moon's	- -	480
Earth's	- -	1600

Sun's mean motion,	59′	8″
Moon's, - -	790	35
Sun's true motion,	60	24
Moon's, - -	743	7
Moon's latitude,	48	45

As the moon's mean motion is to her mean diameter, so is her true motion to her true diameter for the time of opposition $\frac{743'\ 7'' \times \overset{Y}{480}}{790,\ 35} = 451\ 11$ *Yojan*, which, divided by fifteen, quotes 30′ 5″ of a great circle.

As the sun's mean motion is to his mean diameter, so is his true motion to his diameter at the instant of opposition $\frac{60'\ 24'' \times \overset{Y}{6500}}{59'\ 8''} = 6639\ 14$ *Yojan*.

As the moon's mean motion is to the earth's diameter, so is the moon's equated motion to the *Suchi*, or a fourth number, which must be taken as the earth's diameter, for the purpose of proportioning its shadow to the moon's distance and apparent diameter $\frac{1600 \times 743'\ 7''}{790'\ 35''} = 1503\ 56$ *Yojan*, the *Suchi*.

Equated diameter of the sun,	6639 14
Of the earth, - -	1503 56
Diffence,	5039 14

As the sun's mean diameter is to the moon's diameter, so is the difference above 5039 14, to a fourth number, which, deducted from the *Suchi*, or equated diameter of the earth, leaves the diameter of the earth's shadow at the moon, $\frac{\overset{Y}{480} \times \overset{Y}{5039\ 14}}{6500}$ 372. 7, and

1503. 56—372. 7 = 1131. 49 *Yojan*, which, divided by fifteen, quotes 75′ 27″ of a great circle for the fame.

From the half fum of the diameters of the moon and fhadow $\frac{75' 27'' \times 30' 5'}{2} = 52' 46''$ fubtract the moon's latitude 48″ 45″, the remainder is the *Chch'anna*, or portion of the moon's diameter eclipfed, 4′ 1″ of a great circle, and by the nature of a right angled triangle, the fquare root of the difference of the fquares of the moon's latitude, and the half fum of the diameters of the fhadow and moon, will be the path of the moon's centre, from the beginning to the middle of the eclipfe.

The diameter of the fhadow is,	75	27
Of the moon, - - -	30	5
Sum, -	105	32
Half fum,	52	46
The moon's latitude is, -	48	45

$\sqrt{\overline{52.\ 46^2 \times 48.\ 45^2}} = 20'\ 11''$ which, divided by the moon's motion from the fun, quotes the half duration of the eclipfe in *dandas* and *palas*, or *Hindu* mean folar hours, $\frac{20'\ 11'' = 1211''}{682''\ 43'''} = \overset{D}{1}\ \overset{P}{46}\ \overset{V}{25}$; which doubled, is $\overset{D}{3}\ \overset{P}{32}\ \overset{V}{50}$, the whole duration of the eclipfe; which will be partial, the moon's latitude being greater than the difference between the femi-diameters of the moon's difk and the earth's fhadow.

SEVENTH OPERATION,

To find the pofition of the equinoctical colures, and thence the declination of the fun, the length

of day and night, and the time counted from ſunriſe, or hour of the civil day when the eclipſe will happen.

1*ſt*. For the *ayananſa* or diſtance of the vernal equinox from the 1ſt of *Meſha*. $\frac{7144040829 47 \times 600 \text{ Periods.}}{1577917828} = (271650)$ 8*s* 4° 31′ 30″ 52‴ of which take the *bhuja* 8ˢ 4° 31′ 30″ 52‴—6ˢ 2ˢ 4° 31″ 30″ 52″which multiply by three and divide by ten, $\frac{64° 31' 30'' 52 \times 3}{10} = 19° 21' 27''$ the *ayananſa*, which in the preſent age is added to the ſun's longitude, to find his diſtance from the vernal equinox. The ſun's equated longitude is 6*s* 19° 54″ 11″, and 6*s* 19° 54′ 11″ × 19° 21′ 27 = 7*s* 9° 15′ 38″ his diſtance from the vernal equinox.

2*d*. For the declination, right aſcenſion, and aſcenſional difference. The ſun's place is 7*s* 9° 15′ 38″, and 1*s* 9° 15′ 38″ his diſtance from the autumnal equinox; the ſine of which is 2174′ 41′, and as radius is to the ſine of the greateſt declination 24°, termed the *paramapacramajya* 1397′, ſo is 2174. 41 to the ſine of his declination 883′ 40″, the arc correſponding with which, in the canon of ſines, is 14° 53′, $(\frac{1297' \times 2174' 48''}{3438} = 883' 40'')$. The equi-
A V
noctial ſhadow at *Bhagalpur* is 5, 30, and, as the *Gnomon* of twelves *angalas* is to the equinoctial ſhadow, ſo is the ſine of the declination 883, 40, to the
A V
cſhitijya, $\frac{5\ 30 \times 883' 40'}{3438} = 405' 1''$. And as the co-ſine of the declination is to the radius, ſo is the *cſhitijya* to the ſine of the *chara*, or aſcenſional difference, $\frac{405\ 1 \times 3438}{3322\ 36} = 419' 4''$: its arc is 419′ 56″ the aſcenſional difference.

3*d*. For the length of the day and night.

The modern *Hindus* make their computations in mean ſolar time; the *Surya Siddhanta* directs, that

they ſhould be made in ſydereal time. A ſydereal day contains ſixty *dandas*; each *danda*, ſixty *viculas*; and each *vicula* ſix reſpirations, in all 21600 reſpirations, anſwering to the minutes of the equator. A *nacſhatra* day is exceeded in length by the *ſavan* or ſolar day, by reaſon of the ſun's proper motion in the ecliptic, the former meaſures time equably, but the latter varies in its length from the inequality of the ſun's motion, and the obliquity of the ecliptic. The ſun's equated motion for the middle of the eclipſe was found 60′ 24″; and the oblique aſcenſion for the eighth ſign from the vernal equinox, in which he will be found at that time, is taken from the foregoing table 343 *palas*, or 2085 reſpirations. As the number of minutes contained in one ſine 1800, is to the number of reſpirations, or the arc of the equator in minutes anſwering to the oblique aſcenſion of the ſine, the ſun is in 2085, as above, ſo is the equated motion 60′ 24″, to the exceſs in reſpirations of the *ſavan* or ſolar day over the *nacſhatra* or ſydereal day $\frac{2058' \times 60' 24''}{1800} = 69' 3''$; which, added to 21600′ gives the length of the ſolar day by civil account from ſunriſe to ſunriſe, ſydereal time 21669. 3 reſpirations. From one-fourth of this deduct the aſcenſional difference, the ſun being declined towards the ſouth pole, for the ſemidiurnal arc; and add it for the ſeminocturnal arc: the former is 4997′ 19″, and the latter 5837′ 11″; which may be reduced to *dandas*, or *Hindu* hours, by a diviſion of 360. Hence half the day is 13 52 53 (D P V), and half the night 16 12 52 (D P V). The whole day added to half the night ſhows the hour counted from the preceding ſunriſe to midnight 43 58 38 (D P V), to which add the time at midnight unexpired of the *purnima tit'hi*, for the hour of the civil day correſponding with the middle of the eclipſe. The hour from midnight to the end of the *purnima*-

tit'hi is already found $12^{D}\ 51^{P}$ in mean solar time, and to reduce it to sydereal time, say, as 21600′ is to 21600′ × 59′ 8″, so is $12^{D}\ 51^{P}$, to sydereal hours $12^{D}\ 53^{P}$, equal to $2^{D}\ 51^{P}$ solar hours.

	D	V	P
From the preceding sunrise to midnight, is	43	59	—
At midnight will remain of the *purnima tit'hi*, - - -	12	53	—
Hour of the civil day at the middle of the eclipse, - -	56	52	—
Deduct the half duration, - - -	1	46	25
Beginning of the eclipse, - -	55	5	35
Add the whole duration, - -	3	32	50
End of the eclipse, - - -	58	38	25

And the day and night containing together $60^{D}\ 11^{P}\ 30^{V}$, the eclipse should end $1^{D}\ 33^{P}\ 5^{V}$ before sunrise, according to this calculation.

The first day of the creation, according to the *Hindus*, was *Ravi-var*, or *Sunday*: the number of days for which the above calculation has been made, is 714404082947, which, divided by seven, the number of days in a week are 102057726135 weeks and two days; the astronomical day therefore of *Soma-var*, or *Monday*, will end at midnight preceding the eclipse; but the *Soma-var* by civil computation will continue to the next ensuing sunrise; and this *Soma-var*, by calculating the number of days elapsed from the instant the sun entered the sign *Tula*, to his advance of 19° 54′ on that sign, will be found to fall on the 19th of the month *Cartic*, answering to the third of November.

The time of the full moon and the duration of the eclipfe, found by this computation, differ confiderably from the Nautical Almanac. The *Siddhanta Rahafya* and *Grahalaghava*, comparatively modern treatifes, are nearer the truth, yet far from correct. The *Hindus*, in determining thefe phenomena, are fatisfied when within a few minutes of the true time.

A comparative Statement of this Eclipſe as predicted in the Nautical Almanac, with computations of it made by different Hindu books. Thoſe marked (*) are made for different meridians, the laſt I believe for Tirhut.

NAMES.	Equated longitude for midnight at *Bhagalpur*, ſuppoſed in 8° 50′ E. from *Lanca*, and 88° E. from *Greenwich*.											
	The Sun.				*The Moon.*				*The Node.*			
	S	°	′	″	S	°	′	″				
Surya Siddhanta,	6	19	54	11	—	17	28	28	1	—	31	44
Tables of Macaranda,	6	19	55	9	—	17	30	9	1	—	32	7
* Grahalaghava,												
Siddhanta Rahaſya,	6	19	54	29	—	17	16	25	1	—	27	35
	Add to each the *ayananſa* 19° 21′ 27″ for the longitude counted according to *European* aſtronomers from the Equinoctial colure.											
	S	°	′	″	S	°	′	″	S	°	′	″
Surya Siddhanta,	7	9	15	38	1	6	49	55	1	19	53	11
Tables of Macaranda,	7	9	16	36	1	6	51	36	1	19	53	54
* Grahalaghava,												
Siddhanta Rahaſya,	7	9	15	56	1	6	37	52	1	19	49	2
Nautical Almanac.	7	1	47	8	1	7	50	58	1	19	45	30

	From midnight to the middle of the Eclipſe.						Duration of the Eclipſe.					
	Hindu time.			*Engliſh time.*			*Hindu time*			*Eng. time.*		
	D.	V.	P.	H.	M.	S.	D.	P.	V.	H.	M.	S.
Surya Siddhanta,	12	53	—	5	9	12	3	12	50	1	17	8
Tables of Macaranda,							4	50	—	1	46	20
* Grahalaghava,	*14	50	—	5	56	—	5	18	—	1	56	36
Siddhanta Rahaſya,	13	53	—	5	33	—	4	58	—	1	49	16
* Grahana Mala, a Catalogue of Eclipſes,	16	6	—	6	26	24	5	26	—	2	10	24
Nautical Almanac.	16	—	37	0	24	5	5	22	2½	2	9	—

XVI.

ON THE

ANTIQUITY OF THE INDIAN ZODIAC.

BY THE PRESIDENT.

I ENGAGE to ſupport an opinion (which the learned and induſtrious M. *Montucla* ſeems to treat with extreme contempt) that the *Indian* diviſion of the Zodiac was not borrowed from the *Greeks* or *Arabs*, but, having been known in this country from time immemorial, and being the ſame in part with that uſed by other nations of the old *Hindu* race, was probably invented by the firſt progenitors of that race before their diſperſion. "The *Indians*," he ſays, "have two "diviſions of the Zodiac; one, like that of the "*Arabs*, relating to the moon, and conſiſting of "*twenty-ſeven* equal parts, by which they can tell "very nearly the hour of the night; another relating "to the ſun, and, like ours, containing twelve ſigns, "to which they have given as many names, corres- "ponding with thoſe which we have borrowed from "the *Greeks*." All that is true; but he adds, "It "is highly probable that they received them at ſome "time or another by the intervention of the *Arabs*; "for no man, ſurely, can perſuade himſelf, that it is the "ancient diviſion of the Zodiac, formed, according "to ſome authors, by the foreſathers of mankind, "and ſtill preſerved among the *Hindus*." Now I undertake to prove, that the *Indian* Zodiac was not borrowed mediately or directly from the *Arabs* or *Greeks*; and, ſince the ſolar diviſion of it in *India* is the ſame in ſubſtance with that uſed in *Greece*, we may reaſonably conclude, that both *Greeks* and *Hindus* received it from an older nation, who firſt gave names to the

luminaries of heaven, and from whom both *Greeks* and *Hindus*, as their ſimilarity in language and religion fully evinces, had a common deſcent.

The ſame writer afterwards intimates, that "the "time when *Indian* aſtronomy received its moſt "conſiderable improvement, from which it has now, "as he imagines, wholly declined, was either the "age when the *Arabs*, who eſtabliſhed themſelves "in *Perſia* and *Sogdiana*, had a great intercourſe "with the *Hindus*; or that, when the ſucceſſors of "*Chengiz* united both *Arabs* and *Hindus* under one "vaſt dominion." It is not the object of this eſſay to correct the hiſtorical errors in the paſſage laſt-cited, nor to defend the aſtronomers of *India* from the charge of groſs ignorance in regard to the figure of the earth and the diſtances of the heavenly bodies: a charge, which *Montucla* very boldly makes on the authority, I believe, of Father *Souciet*. I will only remark, that, in our converſations with the *Pandits*, we muſt never confound the ſyſtem of the *Jyautiſhicas*, or mathematical aſtronomers, with that of the *Pauranicas*, or poetical fabuliſts; for to ſuch a confuſion alone muſt we impute the many miſtakes of *Europeans* on the ſubject of *Indian* ſcience. A venerable mathematician of this province, named *Ramachandra*, now in his eightieth year, viſited me lately at *Criſhnanagar*; and part of his diſcourſe was ſo applicable to the inquiries, which I was then making, that, as ſoon as he left me, I committed it to writing. "The "*Pauranics*," he ſaid, "will tell you, that our earth "is a plane figure, ſtudded with eight mountains, and "ſurrounded by ſeven ſeas of milk, nectar, and "other fluids; that the part which we inhabit "is one of ſeven iſlands, to which eleven ſmaller "iſles are ſubordinate; that a God, riding on a huge *elephant*, guards each of the eight regions; and

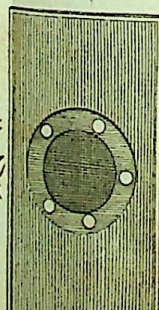
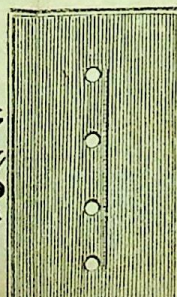
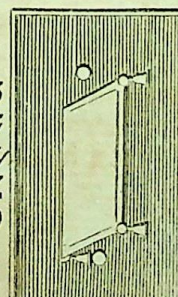
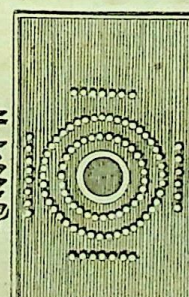
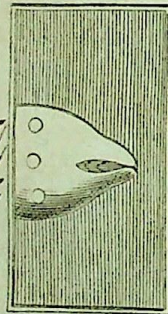
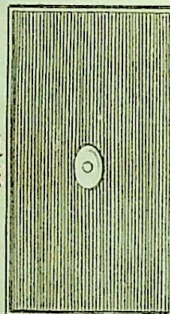
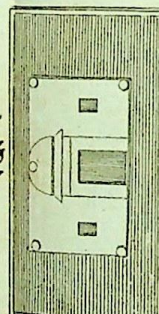
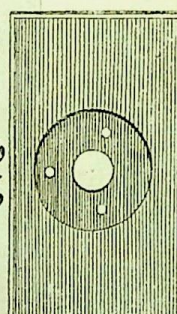
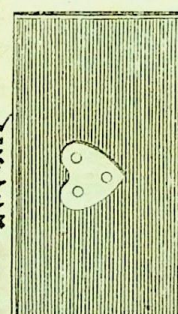
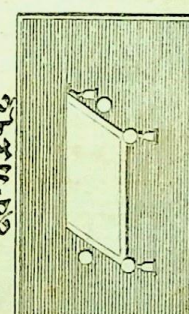
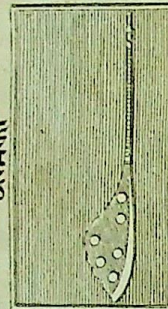
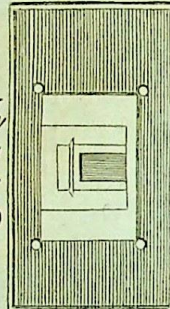
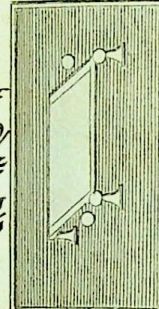
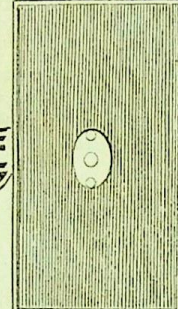
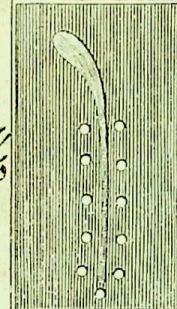
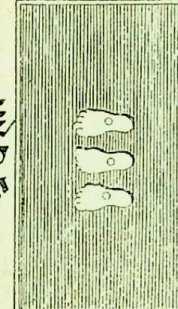
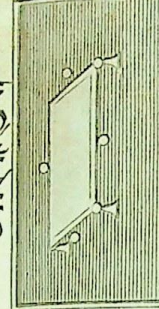
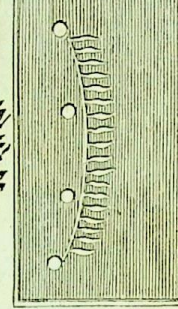
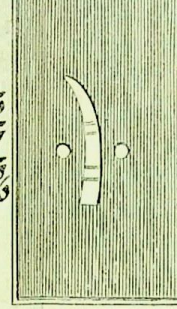
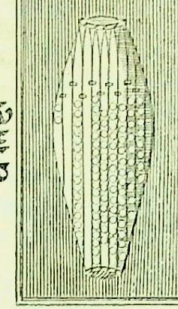
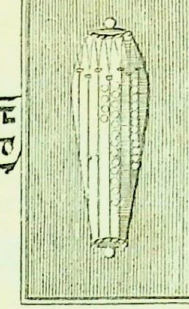
" that a mountain of gold riſes and gleams in the
" centre; but we believe the earth to be ſhaped like a
" *Cadamba* fruit, or ſpheroidal, and admits only four
" oceans of ſalt water, all which we name from the four
" cardinal points, and in which are many great pen-
" inſulas, with innumerable iſlands. They will tell you
" that a dragon's head ſwallows the moon, and thus
" cauſes an eclipſe: but we know that the ſuppoſed
" head and tail of the dragon mean only the nodes, or
" points formed by interſections of the ecliptic and
" moon's orbit. In ſhort, they have imagined a
" ſyſtem which exiſts only in their fancy; but we
" conſider nothing as true without ſuch evidence as
" cannot be queſtioned." I could not perfectly underſtand the old Gymnoſophiſt, when he told me that the *Raſichacra*, or *circle of ſigns* (for ſo he called the Zodiac) was like a *Dhuſtura* flower; meaning the *Datura*, to which the *Sanſcrit* name has been ſoftened, and the flower of which is conical, or ſhaped like a funnel. At firſt I thought that he alluded to a projection of the hemiſphere on the plane of the colure, and to the angle formed by the ecliptic and equator; but a younger aſtronomer, named *Vinayaca*, who came forward to ſee me, aſſured me that they meant only the circular mouth of the funnel, or the baſe of the cone; and that it was uſual among their ancient writers to borrow from fruit and flowers their appellations of ſeveral plane and ſolid figures.

From the two *Brahmans*, whom I have juſt named, I learned the following curious particulars; and you may depend on my accuracy in repeating them, ſince I wrote them in their preſence, as well as corrected what I had written, till they pronounced it perfect. They divide a great circle, as we do, into three hundred and ſixty degrees, called by them *anſas*, or *portions*; of which they, like us, allot thirty to each of the twelve ſigns, in this order:

Meſha, the Ram.	*Túla*, the Balance.
Vriſha, the Bull.	8. *Vriſchica*, the Scorpion.
Mit'huna, the Pair.	*Dhanus*, the Bow.
4. *Carcata*, the Crab.	*Macara*, the Sea-monſter.
Sinha, the Lion.	*Cumbha*, the Ewer.
Canya, the Virgin.	12. *Mina*, the Fiſh.

The figures of the twelve aſteriſms, thus denominated with reſpect to the ſun, are ſpecified by *Sripeti*, author of the *Retnamala*, in *Sanſcrit* verſes; which I produce as my vouchers in the original, with a verbal tranſlation;

Meſhadayo nama, ſamanarupi,
Vinagadadhyam mit'hunam nriyugmam,
Pradipaſaſye dadhati carabhyam
Navi ſt'hita varini canyacaiva.
Tula tulabhrit pretimanapanir
Dhanur dhanuſhman hayawat parangah
Mrigananah ſyan macaro'tha cumbhah
Scandhe nero ri&taghatam dadhanah,
Anyanyapuchch'habhimuc'ho hi minah
Matſyadwayam ſwaſt'halacharinomi.

" The *ram*, *bull*, *crab*, *lion*, and *ſcorpion*, have the
" figures of thoſe five animals reſpectively: the *pair*
" are a damſel playing on a *vina*, and a youth wielding
" a mace; the *virgin* ſtands on a boat in water, hold-
" ing in one hand a lamp, in the other an ear of
" rice-corn; the *balance* is held by a weigher with a
" weight in one hand; the *bow*, by an archer, whoſe

" hinder parts are like those of a horse; the *sea-* " *monster* has the face of an antelope; the *ewer* is a " water-pot borne on the shoulder of a man, who " empties it; the *fish* are two, with their heads turned " to each other's tail: and all these are supposed to " be in such places as suit their several natures."

To each of the *twenty-seven* lunar stations, which they call *nacshatras*, they allow thirteen *ansas* and one third, or *thirteen degrees twenty minutes*; and their names appear in the order of the signs, but without any regard to the figures of them.

Aswini.	*Magha.*	Mula.
Bharani.	Purva p'halguni.	Purva *shadha.*
Critica.	Uttara *p'halguni.*	Uttarashadha.
Rohini.	Hasta.	*Sravana.*
Mrigasiras.	*Chitra.*	Dhanishta.
Ardra.	Swati.	Satabhisha.
Punarvasu.	*Visac'ha.*	Purva *bhadrapada.*
Pushya.	Anuradha.	Uttarabhadrapada.
9. Aslesha.	18. *Jyesht'ha.*	27. Revati.

Between the twenty-first and twenty-second constellations, we find in the plate three stars, called *Abhijit*; but they are the last quarter of the asterism immediately preceding, or the latter *Ashar*, as the word is commonly pronounced. A complete revolution of the moon, with respect to the stars, being made in twenty-seven days, odd hours, minutes, and seconds, and perfect exactness being either not attained by the

Hindus, or not acquired by them, they fixed on the number twenty-ſeven, and inſerted *Abhijit* for ſome aſtrological purpoſe in their nuptial ceremonies. The drawing, from which the plate was engraved, ſeems intended to repreſent the figures of the twenty-ſeven conſtellations, together with *Abhijit*, as they are deſcribed in three ſtanzas by the author of the *Retnamala*:

1. Turagamuc'haſadricſham yonirupam cſhurabham,
Sacataſamam at'hainasyottamangena tulyam,
Manigrihaſara chacrabhani ſalopamam bham,
Sayanaſadriſamanyachchatra paryancarupam.

2. Haſtacarayutam cha maucticaſamam
chanyat pravalopamam,
Dhriſhyam torana ſannibham balinibham,
ſatcundalabham param;
Crudhyatceſarivicramena ſadriſam,
ſayyaſamanam param,
Anyad dentivilaſavat ſt'hitamatah
ſringatacavyacti bham.

3. Trivicramabham cha mridangarupam,
Vrittam tatonyadyamalabhwayabham,
Paryancarupam murajanucaram,
Ityevam aſwadibhachacrarupam.

"A horſe's head, *yoni* or *bhaga*, a razor, a wheel-
"ed carriage, the head of an antelope, a gem, a
"houſe, an arrow, a wheel, another houſe, a bed-
"ſtead, another bedſtead, a hand, a pearl, a piece
"of coral, a feſtoon of leaves, an oblation to the
"Gods, a rich ear-ring, the tail of a fierce lion, a
"couch, the tooth of a wanton elephant, near which

" is the kernel of the *ſringataca*-nut, the three foot-
" ſteps of *Viſhnu*, a tabor, a circular jewel, a two-faced
" image, another couch, and a ſmaller ſort of tabor;
" ſuch are the figures of *Aſwini* and the reſt in the
" circle of lunar conſtellations."

The *Hindu* draughtſman has very ill repreſented moſt of the figures; and he has tranſpoſed the two *Aſharas* as well as the two *Bhadrapads*; but his figure of *Abhijit*, which looks like our ace of hearts, has a reſemblance to the kernel of the *trapa*: a curious water-plant deſcribed in a ſeparate eſſay. In another *Sanſcrit* book, the figures of the ſame conſtellations are thus varied:

A horſe's head.	A ſtraight tail.	A couch.
Yoni, or *bhaga*.	Two ſtars S. to N.	A winnowing fan.
A flame.	Two, N. to S.	Another.
A waggon.	A hand.	An arrow.
A cat's paw.	A pearl.	A tabor.
One bright ſtar.	Red ſaffron.	A circle of ſtars.
A bow.	A feſtoon.	A ſtaff for burdens.
A child's pencil.	A ſnake.	The beam of a balance.
9. A dog's tail.	18. A boar's head.	27. A fiſh.

From twelve of the aſteriſms juſt enumerated, are derived the names of the twelve *Indian* months, in the uſual form of patronymcis; for the *Pauranics*, who reduce all nature to a ſyſtem of emblematical mythology, ſuppoſe a celeſtial nymph to preſide over each of the conſtellations, and feign that the God *Soma*, or *Lunus*, having wedded twelve of them, became the father of twelve *Genii*, or months, who are named after their ſeveral mothers; but the *Jyautiſhi*-

cas aſſert, that, when their lunar year was arranged by former aſtronomers, the moon was at the full in each month on the very day when it entered the *nacſhatra*, from which that month is denominated. The manner in which the derivatives are formed, will beſt appear by a compariſon of the months with their ſeveral conſtellations:

Aſwina.	Chaitra.
Cartica.	8. Vaiſac'ha.
Margaſirſha.	Jyaiſht'ha.
4. Pauſha.	Aſhara.
Magha.	Sravana.
Phalguna.	12. Bhadra.

The third month is alſo called *Agrahayana* (whence the common word *Agran* is corrupted) from another name of *Mrigaſiras*.

Nothing can be more ingenious than the memorial verſes, in which the *Hindus* have a cuſtom of linking together a number of ideas otherwiſe connected, and of chaining, as it were, the memory by a regular meaſure: thus by putting *teeth* for thirty-two; *Rudra* for eleven; *ſeaſon* for ſix; *arrow* or *element* for five; *ocean*, *Veda*, or *age*, for four; *Rama*, *fire*, or *quality*, for three; *eye*, or *Cumara*, for two; and *earth* or *moon* for one, they have compoſed four lines, which expreſs the number of ſtars in each of the twenty-ſeven aſteriſms:

Vahni tri ritwiſhu gunendu critagnibhuta,
Banaſwinetra ſara bhucu yugabdhi ramah,
Rudrabdhiramagunavedaſata dwiyugma,
Denta budhairabhihitah cramaſo bhatarah.

That is, "three, three, ſix; five, three, one;
"four, three, five; five two, two; five, one, one;
"four, four, three; eleven, four, and three; three
"four, an hundred; two, two, thirty-two. Thus have
"the ſtars of the lunar conſtellations, in the order as
"they appear, been numbered by the wiſe."

If the ſtanza was correctly repeated to me, the *two Aſharas* are conſidered as one aſteriſm, and *Abhijit* as three ſeparate ſtars; but I ſuſpect an error in the third line, becauſe *dwibana*, or *two and five*, would ſuit the metre as well as *bdhirama*; and becauſe there were only three *Vedas* in the early age, when, it is probable, the ſtars were enumerated, and the technical verſe compoſed.

Two lunar ſtations, or *manſions*, and a quarter are co-extenſive, we ſee, with one ſign; and nine ſtations correſpond with four ſigns. By counting, therefore, thirteen degrees and twenty minutes from the firſt ſtar in the head of the Ram, incluſively, we find the whole extent of *Aſwini*, and ſhall be able to aſcertain the other ſtars with ſufficient accuracy; but firſt let us exhibit a comparative table of both *Zodiacs*, denoting the manſions, as in the *Varanes* Almanac, by the firſt letters or ſyllables of their names:

Months.	*Solar Aſteriſms.*	*Manſions.*
Aſwin	Meſh	$A + bh + \frac{c}{4}$
Cartic	Vriſh	$\frac{3c}{4} + ro + \frac{M}{2}$
Agrahayan	Mit'hun	$\frac{M}{2} + a + \frac{3P}{4}$
Pauſh	Carcat 4.	$\frac{P}{4} + p +$ ſl. 9.
Magh	Sinh	$m + PU + \frac{U}{4}$
P'halgun	Canya	$\frac{3U}{4} + h + \frac{ch}{2}$
Chaitr	Tula	$\frac{ch}{2} + s + \frac{3v}{4}$
Vaiſac'h	Vriſchic 8.	$\frac{v}{4} + a + j$ 18.
Jaiſht'h	Dhan	$mu + pu + \frac{3u}{4}$
Aſhar	Macar	$\frac{3u}{4} + S + \frac{dh}{2}$
Sravan	Cumbh	$\frac{dh}{2} + s + \frac{3pu}{4}$
Bhadr	Min 12.	$\frac{pu}{4} + u + r.$ 27.

Hence we may readily know the ſtars in each manſion, as they follow in order:

Lunar Manſions.	*Solar Aſteriſms.*	*Stars.*
Aſwini.	Ram.	*Three* in and near the head.
Bharani.	——	*Three* in the tail.
Critica.	Bull	*Six* of the pleiads.
Rohini.	——	*Five* in the head and neck.
Mrigaſiras.	Pair	*Three* in or near the feet, perhaps in the Galaxy.
Ardra.	——	*One* on the knee.

LUNAR MANSIONS.	SOLAR ASTERISMS.	STARS.
Punarvaſu	——	*Four* in the heads, breaſt, and ſhoulder.
Puſhya.	Crab	*Three* in the body and claws.
Aſleſha.	Lion	*Five* in the face and mane.
Magha	——	*Five* in the leg and haunch.
Purvap'halguni.	——	*Two*; one in the tail.
Uttarap'halguni.	Virgin	*Two* on the arm and zone
Haſta.	——	*Five* near the hand.
Chitra.	——	*One* in the ſpike.
Swati.	Balance	*One* in the n. ſcale.
Viſac'ha.	——	*Four* beyond it.
Anurad'ha.	Scorpion	*Four* in the body.
Jyeſht'ha.	——	*Three* in the tail.
Mula.	Bow	*Eleven* to the point of the arrow.
Purvaſhara.	——	*Two* in the leg.
Uttaraſhara.	Sea-monſter	*Two* in the horn.
Sravana.	——	*Three* in the tail.
Dhaniſht'a.	Ewer	*Four* in the arm.
Satabhiſha.	——	*Many* in the ſtream.
Purvabhadrapada.	Fiſh	*Two* in the firſt fiſh.
Uttarabhadrapada.	——	*Two* in the cord.
Revati.	——	*Thirty-two* in the ſecond fiſh and cord.

Wherever the *Indian* drawing differs from the memorial verſe in the *Retnamala*, I have preferred the authority of the writer to that of the painter, who has drawn ſome terreſtrial things with ſo little ſimilitude, that we muſt not implicitly rely on his repreſentation of objects merely celeſtial. He ſeems particularly to have erred in the ſtars *Dhaniſht'a*.

For the aſſiſtance of thoſe who may be inclined to re-examine the twenty-ſeven conſtellations with a chart before them, I ſubjoin a table of the degrees to which the *nacſhatras* extend reſpectively from the firſt ſtar in the aſteriſm of *Aries*, which we now ſee near the beginning of the ſign *Taurus*, as it was placed in the ancient ſphere.

N.	D. M.	N.	D. M.	N.	D. M.
I.	13°. 20′.	X.	133°. 20′.	XIX.	256° 20′
II.	26°. 40′.	XI.	146°. 40′.	XX.	260°. 40′.
III.	40°. 0′.	XII.	160°. 0′.	XXI.	280°. 0′.
IV.	53°. 20′.	XIII.	173°. 20′.	XXII.	293°. 20′.
V.	66°. 40′.	XIV.	186°. 40′.	XXIII.	306°. 40′.
VI.	80°. 0′.	XV.	200°. 0′.	XXIV.	320°. 0′.
VII.	93°. 20′.	XVI.	213°. 20′.	XXV.	333°. 20′.
VIII.	106°. 40′.	XVII.	226°. 40′.	XXVI.	346°. 40′.
IX.	120°. 0′.	XVIII.	240°. 0′.	XXVII.	360°. 0′.

The aſteriſms of the *firſt* column are in the ſigns of *Taurus*, *Gemini*, *Cancer*, *Leo*; thoſe of the *ſecond*, in *Virgo*, *Libra*, *Scorpio*, *Sagittarius*; and thoſe of the *third*, in *Capricornus*, *Aquarius*, *Piſces*, *Aries*. We cannot very much err, therefore, in any ſeries of *three* conſtellations; for, by counting 13° 20′ forwards and backwards, we find the ſpaces occupied by the two extremes, and the intermediate ſpace belongs

of courſe to the middlemoſt. It is not meant that the diviſion of the *Hindu* Zodiac into ſuch ſpaces is exact to a minute, or that *every* ſtar of each aſteriſm muſt neceſſarily be found in the ſpace to which it belongs; but the computation will be accurate enough for our purpoſe; and no lunar manſion can be very remote from the path of the moon. How Father *Souciet* could dream that *Viſac'ha* was in the Northern Crown, I can hardly comprehend; but it ſurpaſſes all comprehenſion that M. *Bailly* ſhould copy his dream, and give reaſons to ſupport it; eſpecially as four ſtars, arranged pretty much like thoſe in the *Indian* figure, preſent themſelves obviouſly near the Balance, or the Scorpion. I have not the boldneſs to exhibit the individual ſtars in each manſion, diſtinguiſhed in *Bayer*'s method, by *Greek* letters, becauſe, though, I have little doubt that the five ſtars of *Aſleſha*, in the form of a wheel, are η, γ, ζ, μ, ε of the *Lion*, and thoſe of *Mula* γ, ε, δ, ζ, φ, τ, σ, ν, ο, ξ, π, of the *Sagittary*: and though I think many of the others equally clear, yet, where the number of ſtars in a manſion is leſs than three, or even than four, it is not eaſy to fix on them with confidence; and I muſt wait, until ſome young *Hindu* aſtronomer, with a good memory and good eyes, can attend my leiſure on ſerene nights at the proper ſeaſons, to point out in the firmament itſelf the ſeveral ſtars of all the conſtellations for which he can find names in the *Sanſcrit* language. The only ſtars, except thoſe in the *Zodiac*, that have yet been diſtinctly named to me, are the *Septarſhi*, *Dhruva*, *Arundhati*, *Viſhnupad*, *Matrimandel*; and, in the ſouthern hemiſphere, *Agaſtya*, or *Canopus*. The twenty-ſeven *Yoga* ſtars, indeed, have particular names, in the order of the *nacſhatras*, to which they belong; and ſince we learn * that the *Hindus* have

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* See p. 270.

determined *the latitude, longitude, and right aſceuſion of each*, it might be uſeful to exhibit the liſt of them: but at preſent I can only ſubjoin the names of twenty-ſeven *Yogas*, or diviſions of the Ecliptic.

Viſhcambha.	*Ganda.*	*Parigha.*
Priti.	*Vriddhi.*	*Siva.*
Ayuſhmat.	*Dhruva.*	*Siddha.*
Saubhagya.	*Vyaghata,*	*Saddhya.*
Sobhana.	*Herſhana.*	*Subha.*
Atiganda.	*Vajra.*	*Sucra.*
Sucarman.	*Aſrij.*	*Brahman.*
Dhriti.	*Vyatipata.*	*Indra.*
Sula.	*Variyas.*	*Vaidhriti.*

Having ſhown in what manner the *Hindus* arrange the *Zodiacal* ſtars with reſpect to the ſun and moon, let us proceed to our principal ſubject, *the antiquity of that double arrangement*. In the firſt place, the *Brahmans* were always too proud to borrow their ſcience from the *Greeks*, *Arabs*, *Moguls*, or any nation of *Mlechch'has*, as they call thoſe who are ignorant of the *Vedas*, and have not ſtudied the language of the Gods. They have often repeated to me the fragment of an old verſe, which they now uſe proverbially, *na nicho yavanatparah*, or *no baſe creature can be lower than a Yavan*; by which name they formerly meant an *Ionian* or *Greek*, and now mean a *Mogul*, or generally, a *Muſelman*. When I mentioned to different *Pandits*, at ſeveral times, and in ſeveral places, the opinion of *Montucla*, they could not prevail on themſelves to oppoſe it by ſerious argument; but ſome laughed heartily; others, with a ſarcaſtic ſmile, ſaid it was a *pleaſant imagination*; and all ſeemed to think it a notion bordering on phrenzy. In fact, although the figures of the

ORIENTAL ZODIAC.

Vol. 2, P. 303,

From 1 to 12 are the 12 Signs. a The Sun. b The Moon. c Mars. d Mercury. e Jupiter. f Venus. g Saturn. h Dragons Head or Assending Node. i Dragons Tail or Descending Node. The center is the Earth surrounded by the Sea. markd with the four Cardinal Points E.W.N.S. W.X.Y.Z.

twelve *Indian* ſigns bear a wonderful reſemblance to thoſe of the *Grecian*, yet they are too much varied for a mere copy, and the nature of the variation proves them to be original; nor is the reſemblance more extraordinary than that, which has often been obſerved, between our *Gothic* days of the week and thoſe of the *Hindus*, which are dedicated to the ſame luminaries, and (what is yet more ſingular) revolve in the ſame order: *Ravi*, the Sun; *Soma*, the Moon; *Mangala*, Tuiſco; *Budha*, Woden; *Vrihaſpati*, Thor; *Sucra*, Freya; *Sani*, Sater; yet no man ever imagined that the *Indians* borrowed ſo remarkable an arrangement from the *Goths* or *Germans*. On the planets I will only obſerve, that *Sucra*, the regent of *Venus*, is, like all the reſt, a *male* deity, named alſo *Uſanas*, and believed to be a ſage of infinite learning: but *Zohrah*, the *Nahid* of the *Perſians*, is a goddeſs like the *Freya* of our *Saxon* progenitors. The drawing, therefore, of the planets, which was brought into *Bengal* by Mr. *Johnſon*, relates to the *Perſian* ſyſtem, and repreſents the genii ſuppoſed to preſide over them, exactly as they are deſcribed by the poet *Hatifi*: "He bedecked "the firmament with ſtars, and ennobled this earth "with the race of men; he gently turned the auſpi-"cious new moon of the feſtival, like a bright jewel, "round the ancle of the ſky; he placed the *Hindu* "*Saturn* on the ſeat of that reſtive elephant, the re-"volving ſphere, and put the rainbow into his hand, "as a hook to coerce the intoxicated beak; he made "ſilken ſtrings of ſun-beams for the lute of *Venus*; "and preſented *Jupiter*, who ſaw the felicity of true "religion, with a roſary of cluſtering pleiads. The "bow of the ſky became that of *Mars* when he was "honoured with the command of the celeſtial hoſt; "for *God* conferred ſovereignty on the Sun; and ſqua-"drons of ſtars were his army."

The names and forms of the lunar conſtellations, eſpecially of *Bharani* and *Abhijit*, indicate a ſimplicity of manners peculiar to an ancient people; and they differ entirely from thoſe of the *Arabian* ſyſtem, in which the very firſt aſteriſm appears in the dual number, becauſe it conſiſts only of two ſtars. *Menzil*, or *the place of alighting*, properly ſignifies a *ſtation*, or *ſtage*, and thence is uſed for an ordinary day's *journey*; and that idea ſeems better applied than *manſion* to ſo inceſſant a traveller as the moon; the *menazilu'l kamar*, or *lunar ſtages*, of the *Arabs* have *twenty-eight* names, in the following order, the particle *al* being underſtood before every word:

Sharatan.	Nathrath.	Ghafr.	Dhabili.
Butain.	Tarf.	Zubaniyah.	Bulaa.
Thurayya.	Jabhah.	Iclil.	Suud.
Debaran.	Zubrah.	Kalb.	Akhbiya.
Hakaah.	Sarfah.	Shaulah.	Mukdim.
Hanaah.	Awwa.	Naaim.	Mukhir.
7. Dhiraa.	14. Simac.	21. Beldah.	28. Riſha.

Now, if we can truſt the *Arabian* lexicographers, the number of ſtars in their ſeveral *menzils* rarely agrees with thoſe of the *Indians*; and two ſuch nations muſt naturally have obſerved, and might naturally have named, the principal ſtars near which the moon paſſes in the courſe of each day, without any communication on the ſubject. There is no evidence, indeed, of a communication between the *Hindus* and *Arabs* on any ſubject of literature or ſcience; for, though we have reaſon to believe that a commercial intercourſe ſubſiſted in very early times between *Yemen* and the weſtern coaſt of *India*, yet the *Brahmans*, who alone are permitted to read the ſix

Vedangas, one of which is the astronomical *Sastra*, were not then commercial, and, most probably, neither could nor would have conversed with *Arabian* merchants. The hostile irruption of the *Arabs* into *Hindustan*, in the eighth century, and that of the *Moguls*, under *Chengiz*, in the thirteenth, were not likely to change the astronomical system of the *Hindus*; but the supposed consequences of *modern* revolutions are out of the question; for, if any historical records be true, we know with as positive certainty, that *Amarsinh* and *Calidas* composed their works before the birth of *Christ*, as that *Menander* and *Terence* wrote before that important epoch. Now the twelve *signs* and twenty-seven *mansions* are mentioned, by the several names before exhibited, in a *Sanscrit* vocabulary by the first of those *Indian* authors; and the second of them frequently alludes to *Rohini* and the rest by name in his *Fatal Ring*, his *Children of the Sun*, and his *Birth of Cumara*: from which poem I produce two lines, that my evidence may not seem to be collected from mere conversation:—

Maitre muhurte sasalanch'hanena,
Yogam gatasuttarap'halganishu.

"When the stars of *Uttarup'halgun* had joined in "a fortunate hour the fawn-spotted moon."

This testimony being decisive against the conjecture of M. *Montucla*, I need not urge the great antiquity of *Menu*'s Institutes, in which the twenty-seven asterisms are called the daughters of *Dacsha* and the consorts of *Soma*, or the Moon; nor rely on the testimony of the *Brahmans*, who assure me with one voice, that the names of the *Zodiacal* stars occur in the *Vedas*; three of which I firmly believe, from internal and external evidence, to be more than *three thousand*

years old. Having therefore proved what I engaged to prove, I will close my essay with a general observation. The result of *Newton*'s researches into the history of the primitive sphere was, "that the practice of obser-"ving the stars began in *Egypt* in the days of *Ammon*, "and was propagated thence by conquest in the reign "of his son *Sisac*, into *Africa*, *Europe*, and *Asia*; "since which time *Atlas* formed the sphere of the *Ly-"bians*; *Chiron*, that of the *Greeks*; and the *Chal-"deans*, a sphere of their own." Now I hope, on some other occasions, to satisfy the public, as I have perfectly satisfied myself that "the practice of ob-"serving the stars began, with the rudiments of civil "society, in the country of those whom we call *Chal-"deans*; from which it was propagated into *Egypt*, "*India*, *Greece*, *Italy*, and *Scandinavia*, before the "reign of *Sisac* or *Sacya*, who by conquest spread a "new system of religion and philosophy from the "*Nile* to the *Ganges* about a thousand years before "*Christ*; but that *Chiron* and *Atlas* were allegorical "or mythological personages, and ought to have no "place in the serious history of our species."

XVII.

ACCOUNT OF THE KINGDOM OF NEPAL.

BY FATHER GIUSEPPE,

Prefect of the Roman Miſſion.

COMMUNICATED BY JOHN SHORE, ESQ.

THE kingdom of *Nepal* is ſituated to the north-eaſt of *Patna*, at the diſtance of ten or eleven days journey from that city. The common road to it lies through the kingdom of *Macwanpur*; but the miſſionaries and many other perſons enter it on the *Bettia* quarter. Within the diſtance of four days journey from *Nepal*, the road is good in the plains of *Hinduſtan*; but in the mountains it is bad, narrow, and dangerous. At the foot of the hills the country is called *Teriani*; and there the air is very unwholeſome from the middle of *March* to the middle of *November*; and people in their paſſage catch a diſorder, called in the language of that country *Aul*, which is a putrid fever, and of which the generality of people who are attacked with it die in a few days; but on the plains there is no apprehenſion of it. Although the road be very narrow and inconvenient for three or four days at the paſſes of the hills, where it is neceſſary to croſs and recroſs the river more than fifty times, yet, on reaching the interior mountains before you deſcend, you have an agreeable proſpect of the extenſive plain of *Nepal*, reſembling an amphitheatre covered with populous towns and villages: the circumference of the plain is about 200 miles, a little irregular, and ſurrounded by hills on all ſides, ſo that no perſon can enter or come out of it without paſſing the mountains.

There are three principal cities in the plain, each of which was the capital of an independent kingdom; the principal city of the three is ſituated to the northward of the plain, and is called *Cat'hmandu:* it contains about 18,000 houſes; and this kingdom, from ſouth to north, extends to the diſtance of twelve or thirteen days journey; as far as the borders of *Tibet*; and is almoſt as extenſive from eaſt to weſt. The king of *Cat'hmandu* has always about fifty thouſand ſoldiers in his ſervice. The ſecond city to the ſouth-weſt of *Cat'hmandu* is called *Lelit Pattan*, where I reſided about four years; it contains near 24,000 houſes; the ſouthern boundary of this kingdom is at the diſtance of four days journey, bordering on the kingdom of *Macwanpur*. The third principal city to the eaſt of *Lelit Pattan* is called *B'hatgan*; it contains about 12,000 families, extends towards the eaſt to the diſtance of five or ſix days journey, and borders upon another nation, alſo independent, called *Ciratas*; who profeſs no religion. Beſides theſe three principal cities, there are many other large and leſs conſiderable towns or fortreſſes, one of which is *Timi*, and another *Cipoli*, each of which contains about 8,000 houſes, and is very populous. All thoſe towns, both great and ſmall, are well built; the houſes are conſtructed of brick, and are three or four ſtories high; their apartments are not lofty; they have doors and windows of wood, well worked and arranged with great regularity. The ſtreets of all their towns are paved with brick or ſtone, with a regular declivity to carry off the water. In almoſt every ſtreet of the capital towns there are alſo good wells made of ſtone, from which the water paſſes through ſeveral ſtone-canals for the public benefit. In every town there are large ſquare varandas, well built, for the accommodation of travellers and the public. Theſe varandas are called *Pali*; and there are many of them, as well as wells, in different parts of the country for public

uſe. There are alſo, on the outſide of the great towns, ſmall ſquare reſervoirs of water, faced with brick, with a good road to walk upon, and a large flight of ſteps for the convenience of thoſe who chooſe to bathe. A piece of water of this kind on the outſide of the city of *Cat'hmandu*, was at leaſt 200 feet long on each ſide of this ſquare; and every part of its workmanſhip had a good appearance.

The religion of *Nepal* is of two kinds; the more ancient is profeſſed by many people who call themſelves *Baryeſu*: they pluck out all the hair from their heads; their dreſs is of coarſe red woollen cloth, and they wear a cap of the ſame: they are conſidered as people of the religious order; and their religion prohibits them from marrying, as it is with the *Lamas* of *Tibet*, from which country their religion was originally brought; but in *Nepal* they do not obſerve this rule, except at their diſcretion. They have large monaſteries, in which every one has a ſeparate apartment, or place of abode; they obſerve alſo particular feſtivals, the principal of which is called *Yatra* in their language, and continues a month or longer, according to the pleaſure of the king. The ceremony conſiſts in drawing an idol, which at *Lelit Pattan* is called *Baghero* *, in a large and richly ornamented car, covered with gilt copper: round about the idol ſtand the king and the principal *Baryeſus*; and in this manner the vehicle is almoſt every day drawn through ſome one of the ſtreets of the city by the inhabitants, who run about beating and playing upon every kind of inſtrument their country affords, which make an inconceivable noiſe.

* I ſuppoſe a name of *Bhagavat* or *Criſhna*: but *Bharga* is *Mahadeva*; and *Bajri*, or *Vajri*, means the *Thunderer*.

The other religion, the more common of the two, is that of the *Brahmens*, and is the ſame as is followed in *Hinduſtan*, with the difference that in the latter country, the *Hindus* being mixed with the *Mohammedans*, their religion alſo abounds with many prejudices, and is not ſtrictly obſerved; whereas in *Nepal*, where there are no *Muſelmans* (except one *Caſhmirian* merchant) the *Hindu* religion is practiſed in its greateſt purity. Every day of the month they claſs under its proper name, when certain ſacrifices are to be performed, and certain prayers offered up in their temples. The places of worſhip are more in number in their towns than, I believe, are to be found in the moſt populous and moſt flouriſhing cities in *Chriſtendom*; many of them are magnificent according to their ideas of architecture, and conſtructed at a very conſiderable expence; ſome of them have four or five ſquare cupolas; and in ſome of the temples two or three of the extreme cupolas, as well as the doors and windows of them, are decorated with gilt copper.

In the city of *Lelit Pattan* the temple of *Baghero* was contiguous to my habitation, and was more valuable, on account of the gold, ſilver, and jewels it contained, than even the houſe of the king. Beſides the large temples, there are alſo many ſmall ones, which have ſtairs, by which a ſingle perſon may aſcend on the outſide all around them; and ſome of thoſe ſmall temples have four ſides, others ſix, with ſmall ſtone or marble pillars, poliſhed very ſmooth, with two or three pyramidal ſtories, and all their ornaments well gilt and neatly worked, according to their ideas of taſte: and I think, that, if *Europeans* ſhould ever go into *Nepal*, they might take ſome models from thoſe little temples, eſpecially from the two which are in the great court of *Lelit Pattan*, before the royal palace. On the outſide of ſome of their temples there are alſo great ſquare pillars of ſingle ſtones, from twenty to

thirty feet high, upon which they place their idols, ſuperbly gilt. The greateſt number of their temples have a good ſtone ſtaircaſe in the middle of the four ſquares, and at the end of each flight of ſtairs there are lines cut out of ſtones on both ſides. Round about their temples there are alſo bells, which the people ring on particular occaſions; and when they are at prayers, many cupolas are alſo quite filled with little bells, hanging by cords in the inſide, about the diſtance of a foot from each other, which make a great noiſe on that quarter where the wind conveys the ſound. There are not only ſuperb temples in their great cities, but alſo within their caſtles.

To the eaſtward of *Cat'hmandu*, at the diſtance of two or three miles, there is a place called *Tolu*, by which there flows a ſmall river, the water of which is eſteemed holy, according to their ſuperſtitious ideas; and thither they carry people of high rank, when they are thought to be at the point of death. At this place there is a temple, which is not inferior to the beſt and richeſt in any of the capital cities. They alſo have it in tradition, that, at two or three places in *Nepal*, valuable treaſures are concealed under ground. One of thoſe places they believe is *Tolu*; but no one is permitted to make uſe of them except the king, and that only in caſes of neceſſity. Thoſe treaſures, they ſay, have been accumulated in this manner:—When any temple had become very rich from the offerings of the people, it was deſtroyed, and deep vaults dug under ground, one above another, in which the gold, ſilver, gilt copper, jewels, and every thing of value were depoſited. When I was in *Nepal*, *Gainprejas*, king of *Cat'hmandu*, being in the utmoſt diſtreſs for money to pay his troops, in order to ſupport himſelf againſt *Prit'hwinarayan*, ordered ſearch to be made for the treaſures of *Tolu*; and, having dug to a conſiderable depth under ground, they came to the firſt

vault; from which his people took to the value of a lac of rupees in gilt copper, with which *Gainprejas* paid his troops, exclusive of a number of small figures in gold, or gilt copper, which the people who had made the search had privately carried off; and this I know very well; because one evening as I was walking in the country alone, a poor man, whom I met on the road, made me an offer of a figure of an idol in gold, or copper gilt, which might be five or six sicca weight, and which he cautiously preserved under his arm; but I declined accepting it. The people of *Gainprejas* had not completely emptied the first vault, when the army of *Prit'hwinarayan* arrived at *Tolu*, possessed themselves of the place where the treasure was deposited, and closed the door of the vault, having first replaced all the copper there had been on the outside.

To the westward also of the great city of *Lelit Pattan*, at the distance of only three miles, is a castle called *Banga*, in which there is a magnificent temple. No one of the missionaries ever entered into this castle, because the people who have the care of it have such a scrupulous veneration for this temple, that no person is permitted to enter it with his shoes on; and the missionaries, unwilling to show such respect to their false deities, never entered it. But when I was at *Nepal*, this castle being in possession of the people of *Gorc'ha*, the commandant of the castle and of the two forts which border on the road, being a friend of the missionaries, gave me an invitation to his house, as he had occasion for a little physic for himself and some of his people. I then, under the protection of the Commandant, entered the castle several times, and the people durst not oblige me to take off my shoes. One day, when I was at the Commandant's house, he had occasion to go into the varanda, which is at the bottom of the great court

facing the temple, where all the chiefs dependent upon his orders were aſſembled, and where alſo was collected the wealth of the temple; and, wiſhing to ſpeak to me before I went away, he called me into the varanda. From this incident I obtained a ſight of the temple, and then paſſed by the great court which was in front; it is entirely marble, almoſt blue, but interſperſed with large flowers of bronze well-diſpoſed, to form the pavement of the great court-yard, the magnificence of which aſtoniſhed me; and I do not believe there is another equal to it in *Europe*.

Beſides the magnificence of the temples, which their cities and towns contain, there are many other rarities. At *Cat'hmandu*, on one ſide of the royal garden, there is a large fountain, in which is one of their idols, called *Narayan*. This idol is of blue ſtone, crowned and ſleeping on a mattreſs of the ſame kind of ſtone, and the idol and mattreſs appear as floating upon the water. This ſtone-machine is very large: I believe it to be eighteen or twenty feet long, and broad in proportion; but well worked, and in good repair.

In a wall of the royal palace of *Cat'hmandu*, which is built upon the court before the palace, there is a great ſtone of a ſingle piece, which is about fifteen feet long, and four or five feet thick: on the top of this grear ſtone there are four ſquare holes at equal diſtances from each other. In the inſide of the wall they pour water into the holes, and in the court-ſide, each hole having a cloſed canal, every perſon may draw water to drink. At the foot of the ſtone is a large ladder, by which people aſcend to drink; but the curioſity of the ſtone conſiſts in its being quite covered with characters of different languages cut upon it. Some lines contain the characters of the language of the country; others the characters of

Tibet, others *Perſian*, others *Greek*, beſides ſeveral others of different nations; and in the middle there is a line of *Roman* characters, which appears in this form AVTOMNEW INTER LHIVERT; but none of the inhabitants have any knowledge how they came there, nor do they know whether or not any *European* had ever been in *Nepal* before the miſſionaries, who arrived there only the beginning of the preſent century. They are manifeſtly two *French* names of ſeaſons, with an *Engliſh* word between them.

There is alſo to the northward of the city of *Cat'hmandu* a hill called *Simbi*, upon which are ſome tombs of the *Lamas* of *Tibet*, and other people of high rank of the ſame nation. The monuments are conſtructed after various forms; two or three of them are pyramidal, very high, and well ornamented; ſo that they have a very good appearance, and may be ſeen at a conſiderable diſtance. Round theſe monuments are remarkable ſtones covered with characters, which probably are the inſcriptions of ſome of the inhabitants of *Tibet*, whoſe bones were interred there. The natives of *Nepal* not only look upon the hill as ſacred, but imagine it is protected by their idols; and from this erroneous ſuppoſition, never thought of ſtationing troops there for the defence of it, although it be a poſt of great importance, and only at a ſhort mile's diſtance from the city; but during the time of hoſtilities a party of *Prit'hwinarayan*'s troops being purſued by thoſe of *Gainprejas*, the former, to ſave themſelves, fled to this hill, and, apprehending no danger from its guardian idols, they poſſeſſed themſelves of it, and erected a fortification (in their own ſtyle) to defend themſelves. In digging the ditches round the fort, which were adjoining to the tombs, they found conſiderable pieces of gold, with a quantity of which metal the corpſes of the grandees of *Tibet*

are always interred; and when the war was ended, I myself went to see the monuments upon the hills.

I believe that the kingdom of *Nepal* is very ancient, because it has always preserved its peculiar language and independence; but the cause of its ruin is the dissention which subsists among the three kings. After the death of their sovereign, the nobles of *Lelit Pattan* nominated for their king *Gainprejas*, a man possessed of the greatest influence in *Nepal*; although some years afterwards they removed him from his government, and conferred it upon the king of *Bhatgan*; but he also a short time afterwards was deposed; and, after having put to death another king who succeeded him, they made an offer of the government to *Prit'hwinarayan*, who had already commenced war. *Prit'hwinarayan* deputed one of his brothers, by name *Delmerden Sah*, to govern the kingdom of *Lelit Pattan*, and he was in the actual government of it, when I arrived at *Nepal*; but the nobles perceiving that *Prit'hwinarayan* still continued to interrupt the tranquillity of the kingdom, they disclaimed all subjection to him, and acknowledged for their sovereign *Delmerden Sah*, who continued the war against his brother *Prit'hwinarayan*: but some years afterwards they even deposed *Delmerden Sah*, and elected in his room a poor man of *Lelit Pattan*, who was of royal origin.

The king of *Bhatgan*, in order to wage war with the other kings of *Nepal*, had demanded assistance from *Prit'hwinarayan*; but seeing that *Prit'hwinarayan* was possessing himself of the country, he was obliged to desist, and to take measures for the defence of his own possessions; so that the king of *Gorc'ha*, although he had been formerly a subject of *Gainprejas*, taking advantage of the dissentions which prevailed among the other kings of *Nepal*, attached to his party many

mountain-chiefs, promising to keep them in possession, and also to augment their authority and importance; and if any of them were guilty of a breach of faith, he seized their country as he had done to the kings of *Marecajis*, although his relations.

The king of *Gorc'ha* having already possessed himself of all the mountains which surround the plain of *Nepal*, began to descend into the flat country, imagining he should be able to carry on his operations with the same facility and success as had attended him on the hills; and, having drawn up his army before a town, containing about 8000 houses, situate upon a hill called *Cirtipur*, about a league's distance from *Cat'hmandu*, employed his utmost endeavours to get possession of it. The inhabitants of *Cirtipur* receiving no support from the king of *Lelit Pattan*, to whom they were subject, applied for assistance to *Gainprejas*, who immediately marched with his whole army to their relief, gave battle to the army of the king of *Gorc'ha*, and obtained a complete victory. A brother of the king of *Gorc'ha* was killed on the field of battle; and the king himself, by the assistance of good bearers, narrowly escaped with his life, by fleeing into the mountains. After the action, the inhabitants of *Cirtipur* demanded *Gainprejas* for their king, and the nobles of the town went to confer with him on the business; but, being all assembled in the same apartment with the king, they were all surprised and seized by his people. After the seizure of those persons, *Gainprejas*, perhaps to revenge himself of those nobles, for having refused their concurrence to his nomination as king, privately caused some of them to be put to death; another, by name *Danuvanta*, was led through the city in a woman's dress, along with several others, clothed in a ridiculous and whimsical manner, at the expence of the nobles of *Lelit Pattan*. They were

then kept in close confinement for a long time. At last, after making certain promises, and interesting all the principal men of the country in their behalf, *Gainprejas* set them at liberty.

The king of *Gorc'ha*, despairing of his ability to get possession of the plain of *Nepal* by strength, hoped to effect his purpose by causing a famine, and with this design, stationed troops at all the passes of the mountains to prevent any intercourse with *Nepal*; and his orders were most rigorously obeyed, for every person who was found in the road, with only a little salt or cotton about him, was hung upon a tree; and he caused all the inhabitants of a neighbouring village to be put to death in a most cruel manner (even the women and children did not escape) for having supplied a little cotton to the inhabitants of *Nepal*; and, when I arrived in that country at the beginning of 1769, it was a most horrid spectacle to behold so many people hanging on the trees in the road. However, the king of *Gorc'ha* being also disappointed in his expectations of gaining his end by this project, fomented dissentions among the nobles of the three kingdoms of *Nepal*, and attached to his party many of the principal ones, by holding forth to them liberal and enticing promises; for which purpose he had about 2000 *Brahmens* in his service. When he thought he had acquired a party sufficiently strong, he advanced a second time with his army to *Cirtipur*, and laid siege to it on the north-west quarter, that he might avoid exposing his army between the two cities of *Cat'hmandu* and *Lelit Pattan*. After a siege of several months, the king of *Gorc'ha* demanded the regency of the town of *Cirtipur*, when the commandant of the town, seconded by the approbation of the inhabitants, dispatched to him by an arrow a very impertinent and exasperating answer. The king of *Gorc'ha* was so much enraged at this mode of proceeding, that he gave im-

mediate orders to all his troops to ſtorm the town on every ſide: but the inhabitants bravely defended it, ſo that all the efforts of his men availed him nothing; and, when he ſaw that his army had failed of gaining the precipice, and that his brother, named *Suruparatna*, had fallen wounded by an arrow, he was obliged to raiſe the ſiege a ſecond time, and to retreat with his army from *Cirtipur*. The brother of the king was afterwards cured of his wound by our father *Michael Angelo*, who is at preſent in *Bettia*.

After the action, the king of *Gorc'ha* ſent his army againſt the king of *Lamji* (one of the twenty-four kings who reign to the weſtward of *Nepal*) bordering upon his own kingdom of *Gorc'ha*. After many deſperate engagements, an accommodation took place with the king of *Lamji*: and the king of *Gorc'ha* collecting all his forces, ſent them for the third time to beſiege *Cirtipur*; and the army on this expedition was commanded by his brother *Suruparatna*. The inhabitants of *Cirtipur* defended themſelves with their uſual bravery, and, after a ſiege of ſeveral months, the three kings of *Nepal* aſſembled at *Cat'hmandu* to march a body of troops to the relief of *Cirtipur*. One day in the afternoon they attacked ſome of the *Tanas* of the *Gorc'hians*, but did not ſucceed on forcing them, becauſe the king of *Gorc'ha*'s party had been reinforced by many of the nobility, who, to ruin *Gainprejas*, were willing to ſacrifice their own lives. The inhabitants of *Cirtipur* having already ſuſtained ſix or ſeven months ſiege, a noble of *Lelit Pattan*, called *Danuvanta*, fled to the *Gorc'ha* party, and treacherouſly introduced their army into the town. The inhabitants might ſtill have defended themſelves, having many other fortreſſes in the upper parts of the town to retreat to; but the people at *Gorc'ha* having publiſhed a general amneſty, the inhabitants, greatly exhauſted by the fatigues of a long ſiege, ſurrendered

themſelves priſoners upon the faith of that promiſe. In the mean time the men of *Gorc'ha* ſeized all the gates and fortreſſes within the town; but two days afterwards *Prit'hwinarayan*, who was at *Navacuta* (a long day's journey diſtant) iſſued an order to *Surupa-ratna* his brother, to put to death all the principal inhabitants of the town, and to cut off the noſes and lips of every one, even infants, who were not found in the arms of their mothers; ordering at the ſame time all the noſes and lips which had been cut off, to be preſerved, that he might aſcertain how many ſouls there were; and to change the name of the town into *Naſkatapur*, which ſignifies *the town of cut-noſes.* The order was carried into execution with every mark of horror and cruelty, none eſcaping but thoſe who could play on wind inſtruments; although Father *Michael Angelo*, who, without knowing that ſuch an inhuman ſcene was then exhibited, had gone to the houſe of *Suruparatna*, and interceded much in favour of the poor inhabitants. Many of them put an end to their lives in deſpair; others came in great bodies to us, in ſearch of medicines; and it was moſt ſhocking to ſee ſo many living people with their teeth and noſes reſembling the ſkulls of the deceaſed.

After the capture of *Cirtipur*, *Prit'hwinarayan* diſpatched immediately his army to lay ſiege to the great city of *Lelit Pattan*. The *Gorc'hians* ſurrounded half the city to the weſtward with their *Tanas*; and, my houſe being ſituated near the gate of that quarter, I was obliged to retire to *Cat'hmandu*, to avoid being expoſed to the fire of the beſiegers. After many engagements between the inhabitants of the town of *Lelit Pattan* and the men of *Gorc'ha*, in which much blood was ſpilt on both ſides, the former were diſpoſed to ſurrender themſelves, from the fear of having their noſes cut off, like thoſe at *Cirtipur*, and alſo their right hands: a barbarity the *Gorc'hians* had threatened them with, unleſs they would ſurrender within

five days. One night all the *Gorc'hians* quitted the siege of *Lelit Pattan* to pursue the *English* army, which, under the command of Captain *Kinloch*, had already taken *Siduli*, an important fort at the foot of the *Nepal*-hills, which border upon the kingdom of *Tirhut*: but Captain *Kinloch* not being able to penetrate the hills, either on the *Siduli* quarter or by the pass at *Hereapur*, in the kingdom of *Macwanpur*, the army of *Gorc'ha* returned to *Nepal* to direct their operations against the city of *Cat'hmandu*, where *Gainprejas* was, who had applied for succour to the *English*. During the siege of *Cat'hmandu* the *Brahmens* of *Gorc'ha* came almost every night into the city, to engage the chiefs of the people on the part of their king; and the more effectually to impose upon poor *Gainprejas*, many of the principal *Brahmens* went to his house, and told him to persevere with confidence, that the chiefs of the *Gorc'ha* army were attached to his cause, and that even they themselves would deliver up their king *Prit'hwinarayan* into his hands. Having by these artifices procured an opportunity of detaching from his party all his principal subjects, tempting them with liberal promises according to their custom, one night the men of *Gorc'ha* entered the city without opposition, and the wretched *Gainprejas*, perceiving he was betrayed, had scarce time to escape with about three hundred of his best and most faithful *Hindustani* troops towards *Lelit Pattan*; which place however he reached the same night.

The king of *Gorc'ha* having made himself master of *Cat'hmandu* in the year 1768, persisted in the attempt of possessing himself also of the city of *Lelit Pattan*, promising all the nobles that he would suffer them to remain in the possession of their property, that he would even augment it; and because the nobles of *Lelit Pattan* placed no reliance on the faith of his promises, he sent his domestic priest to make this protestation, That, if he

failed to acquit himſelf of his promiſe, he ſhould draw curſes upon himſelf and his family even to the fifth paſt and ſucceeding generation; ſo that the unhappy *Gainprejas*, and the king of *Lelit Pattan*, ſeeing that the nobility were diſpoſed to render themſelves ſubject to the king of *Gorc'ha*, withdrew themſelves with their people to the king of *B'hatgan*. When the city of *Lelit Pattan* became ſubject to the king of *Gorc'ha*, he continued for ſome time to treat the nobility with great attention, and propoſed to appoint a viceroy of the city from among them. Two or three months afterwards, having appointed the day for making his formal entrance into the city of *Lelit Pattan*, he made uſe of innumerable ſtratagems to get into his poſſeſſion the perſons of the nobility; and in the end ſucceeded. He had prevailed upon them to permit their ſons to remain at court as companions of his ſon; he had diſpatched a noble of each houſe to *Navacut*, or *New Fort*, pretending that the apprehenſions he entertained of them had prevented his making a public entrance into the city; and the remaining nobles were ſeized at the river without the town, where they went to meet him agreeably to a prior engagement. Afterwards he entered the city, made a viſit to the temple of *Baghero* adjoining to our habitation, and paſſing in triumph thro' the city amidſt immenſe numbers of ſoldiers who compoſed his train, entered the royal palace which had been prepared for his reception; in the mean time parties of his ſoldiers broke open the houſes of the nobility, ſeized all their effects, and threw the inhabitants of the city into the utmoſt conſternation. After having cauſed all the nobles who were in his power to be put to death, or rather their bodies to be mangled in a horrid manner, he departed with a deſign of beſieging *B'hatgan*; and we obtained permiſſion, through the intereſt of his ſon, to retire with all the *Chriſtians* into the poſſeſſions of the *Engliſh*.

At the commencement of the year 1769, the king of *Gorc'ha* acquired poſſeſſion of the city of *B'hatgan* by the ſame expedients to which he owed his former ſucceſſes; and on his entrance with his troops into the city, *Gainprejas*, ſeeing he had no reſource left to ſave himſelf, ran courageouſly with his attendants towards the king of *Gorc'ha*, and, at a ſmall diſtance from his palanquin, received a wound in his foot, which a few days afterwards occaſioned his death. The king of *Lelit Pattan* was confined in irons till his death; and the king of *B'hatgan*, being very far advanced in years, obtained leave to go and die at *Benares*. A ſhort time afterwards the mother of *Gainprejas* alſo procured the ſame indulgence, having from old age already loſt her eye-ſight; but before her departure they took from her a necklace of jewels (as ſhe herſelf told me) when ſhe arrived at *Patna* with the widow of her grandſon: and I could not refrain from tears, when I beheld the miſery and diſgrace of this blind and unhappy queen.

The king of *Gorc'ha*, having thus in the ſpace of four years effected the conqueſt of *Nepal*, made himſelf maſter alſo of the country of the *Ciratas* to the eaſt of it, and of other kingdoms, as far as the borders of *Coch Bihar*. After his deceaſe, his eldeſt ſon *Pratap Sinh* held the government of the whole country: but ſcarcely two years after, on *Pratap Sinh*'s death, a younger brother, by name *Bahadar Sah*, who reſided then at *Bettia* with his uncle *Delmerden Sah*, was invited to accept of the government: and the beginning of his government was marked with many maſſacres. The royal family is in the greateſt confuſion, becauſe the queen lays claim to the government in the name of her ſon, whom ſhe had by *Pratap Sinh*; and perhaps the oath violated by *Prit'hwinarayan* will in the progreſs of time have its effect. Such have been the ſucceſſors of the kingdoms of *Nepal*, of which *Prit'hwinarayan* had thus acquired poſſeſſion.

XVIII.

ON THE CURE OF PERSONS BITTEN BY SNAKES.

BY JOHN WILLIAMS, ESQ.

THE following ſtatement of facts, relative to the cure of perſons bitten by ſnakes, ſelected from a number of caſes which have come within my own knowledge, require no prefatory introduction, as it points out the means of obtaining the greateſt ſelf-gratification the human mind is capable of experiencing,—That of the preſervation of the life of a fellow-creature, and ſnatching him from the jaws of death; by a method which every perſon is capable of availing himſelf of. Eau de Luce, I learn from many communications which I have received from differents parts of the country, anſwers as well as the pure cauſtic alkali ſpirit; and though, from its having ſome eſſential oils in its compoſition, it may not be ſo powerful, yet, as it muſt be given with water, it only requires to increaſe the doſe in proportion; and, ſo long as it retains its milky white colour, it is ſufficiently efficacious.

From the effect of a ligature applied between the part bitten and the heart, it is evident that the poiſon diffuſes itſelf over the body by the returning venous blood; deſtroying the irritability, and rendering the ſyſtem paralytic. It is therefore probable that the volatile cauſtic alkali, in reſiſting the diſeaſe of the poiſon, does not act ſo much as a ſpecific in deſtroying its quality, as by counteracting the effect on the ſyſtem, by ſtimulating the fibres, and preſerving that irritability which it tends to deſtroy.

CASE I.

In the month of *Auguſt* 1780, a ſervant of mine was bitten in the heel, as he ſuppoſed, by a ſnake; and in a few minutes was in great agony, with convulſions about the throat and jaws, and continual grinding of the teeth. Having a wiſh to try the effects of volatile alkali in ſuch caſes, I gave him about forty drops of Eau de Luce in water, and applied ſome of it to the part bitten. The doſe was repeated every eight or ten minutes, till a ſmall phialful was expended: it was near two hours before it could be ſaid he was out of danger. A numbneſs and pricking ſenſation was perceived extending itſelf up to the knee, where a ligature was applied ſo tight, as to ſtop the returning venous blood, which ſeemingly checked the progreſs of the deleterious poiſon. The foot and leg, up to where the ligature was made, were ſtiff and painful for ſeveral days; and, which appeared very ſingular, were covered with a branny ſcale.

The above was the firſt caſe in which I tried the effects of the volatile alkali; and, apprehending that the eſſential oils in the compoſition of Eau de Luce, though made of the ſtrong cauſtic volatile ſpirit, would conſiderably diminiſh its powers, I was induced, the next opportunity that offered, to try the effects of pure volatile cauſtic alkali ſpirit, and accordingly prepared ſome from quicklime and the ſal ammoniac of this country.

CASE II.

In *July* 1782, a woman of the *Brahmen* caſt, who lived in the neighbourhood at *Chunar*, was bitten by a *Cobra ae Capello* between the thumb and fore-finger of her right hand. Prayers and ſuperſtitious incantations were practiſed by the *Brahmans* about her, till ſhe became ſpeechleſs and convulſed, with locked

jaws, and a profuſe diſcharge of ſaliva running from her mouth. On being informed of the accident, I immediately ſent a ſervant with a bottle of the volatile cauſtic alkali ſpirit, of which he poured about a teaſpoonful, mixed with water, down her throat, and applied ſome of it to the part bitten. The doſe was repeated a few minutes after, when ſhe was evidently better, and in about half an hour was perfectly recovered.

This accident happened in a ſmall hut, where I ſaw the ſnake, which was a middle-ſized *Cobra de Capello*. The *Brahmens* would not allow it to be killed. In the above caſe, no other means whatever were uſed for the recovery of the patient than are here recited.

CASE III.

A woman-ſervant in the family of a gentleman at *Benares*, was bitten in the foot by a *Cobra de Capello*. The gentleman immediately applied to me for ſome of the volatile cauſtic alkali, which I fortunately had by me. I gave her about ſixty drops in water, and alſo applied ſome of it to the part bitten. In about ſeven or eight minutes after, ſhe was quite recovered. In the above caſe, I was not witneſs to the deleterious effect of the poiſon on the patient; but ſaw the ſnake after it was killed.

CASE IV.

In *July* 1784, the wife of a ſervant of mine was bitten by a *Cobra de Capello* on the outſide of the little toe of her right foot. In a few minutes ſhe became convulſed, particularly about the jaws and throat, with a continued gnaſhing of the teeth. She at firſt complained of a numbneſs extending from the

wound upwards; but no ligature was applied to the limb. About ſixty drops of the volatile cauſtic ſpirit were given to her in water, by forcing open her mouth, which was ſtrongly convulſed: in about ſeven minutes the doſe was repeated, when the convulſions left her; and in three more ſhe became ſenſible, and ſpoke to thoſe who attended her. A few drops of the ſpirit had alſo been applied to the wound. The ſnake was killed and brought to me, which proved to be a *Cobra de Capello.*

CASE V.

As it is generally believed that the venom of ſnakes is more malignant during hot dry weather than at any other ſeaſon, the following caſe, which occurred in the month of *July* 1788, when the weather was extremely hot, no rain, excepting a ſlight ſhower, having fallen for many months, may not be unworthy of notice:—

A ſervant belonging to an officer at *Juanpoor*, was bitten by a ſnake on the leg, about two inches above the outer ancle. As the accident happened in the evening, he could not ſee what ſpecies of ſnake it was. He immediately tied a ligature above the part bitten; but was in a few minutes in ſuch exquiſite torture from pain, which extended up his body and to his head, that he ſoon became dizzy and ſenſeleſs. On being informed of the accident, I ſent my ſervant with a phial of the volatile cauſtic alkali, who found him, when he arrived, quite torpid, with the ſaliva running out of his mouth, and his jaws ſo faſt locked, as to render it neceſſary to uſe an inſtrument to open them, and adminiſter the medicine. About forty drops of the volatile cauſtic ſpirit were given to him in water, and applied to the wound; and the ſame doſe repeated a few minutes after. In about half an hour he was per-

fectly recovered. On examining the part bitten, I could discover the marks of three fangs; two on one side, and one on the other; and, from the distance they were asunder, I should judge it a large snake. More than ten minutes did not appear to have elapsed from the time of his being bitten till the medicine was administered. The wounds healed immediately, and he was able to attend to his duty the next day. Though the species of snake was not ascertained, yet I judge, from the flow of saliva from the mouth, convulsive spasms of the jaws and throat, as well as from the marks of three fangs, that it must have been a *Cobra de Capello*; and, though I have met with five and six fangs of different sizes in snakes of that species, I never observed the marks of more than two having been applied in biting in any other case which came within my knowledge.

CASE VI.

In *September* 1786, a servant belonging to Captain S——, who was then at *Benares*, was bitten in the leg by a large *Cobra de Capello*. He saw the snake coming towards him, with his neck spread out in a very tremendous manner, and endeavoured to avoid him; but, before he could get out of his way, the snake seized him by the leg, and secured his hold for some time, as if he had not been able to extricate his teeth. Application was immediately made to his master for a remedy, who sent to consult me; but, before I arrived, had given him a quantity of sweet oil, which he drank. So soon as I saw him, I directed the usual dose of volatile caustic alkali to be given, which fortunately brought away the oil from his stomach, or it is probable that the stimulating effect of the volatile spirit would have been so much blunted by it, as to have become inefficacious: a second dose was immediately administered, and some time after, a third,

The man recovered in the courſe of a few hours. As oil is frequently adminiſtered as a remedy in the bite of ſnakes, I think it neceſſary to caution againſt the uſe of it with the volatile alkali, as it blunts the ſtimulating quality of the ſpirit, and renders it uſeleſs.

Of the numerous ſpecies of ſnakes which I have met with, not above ſix were provided with poiſonous fangs; though I have examined many which have been conſidered by the natives as dangerous, without being able to diſcover any thing noxious in them.

The following is an inſtance of the deleterious effect of the bite of a ſnake, called by the natives *Krait*, a ſpecies of the *Boa*, which I have frequently met with in this part of the country:—

CASE VII.

On the 16th *September* 1788, a man was brought to me who had been bitten by a ſnake, with the marks of two fangs on two of his toes; he was ſaid to have been bitten above an hour before I ſaw him: he was perfectly ſenſible, but complained of great pain in the parts bitten, with an unuſual languor. I immediately gave him thirty drops of the volatile cauſtic alkali ſpirit in water, and applied ſome of it to the wounds. In a few minutes he became eaſier, and in about half an hour was carried away by his friends, with perfect confidence in his recovery, without having taken a ſecond doſe of the medicine, which indeed did not appear to have been neceſſary; but, whether from the effect of the bite of the ſnake, or the motion of the dooly on which he was carried, I know not; but he became ſick at the ſtomach, threw up the medicine, and died in about a quarter of an hour after. The man ſaid that the ſnake came up to him

while he was ſitting on the ground; and that he put him away with his hand once, but that he turned about and bit him, as deſcribed. The ſnake was brought to me, which I examined: it was about two feet and a half long, of a lightiſh brown colour on the back, a white belly, and annulated from end to end with 208 abdominal and forty-ſix tail ſcuta. I have met with ſeveral of them from thirteen inches to near three feet in length: it had two poiſonous fangs in the upper jaw, which lay naked, with their points without the upper lip. It does not ſpread its neck, like the *Cobra de Capello*, when enraged; but is very active and quick in its motion.

I have ſeen inſtances of perſons bitten by ſnakes, who have been ſo long without aſſiſtance, that, when they have been brought to me, they have not been able to ſwallow, from convulſions of the throat and fauces; which is, I obſerve, a conſtant ſymptom of the bite of the *Cobra de Capello*: and indeed I have had many perſons brought to me who had been dead ſome time; but never knew an inſtance of the volatile cauſtic alkali failing in its effect, where the patient has been able to ſwallow it.

XIX.

ON SOME ROMAN COINS FOUND AT NELORE.

TO THE PRESIDENT OF THE ASIATIC SOCIETY.

SIR,

I HAVE the honour to preſent you with an extract of a letter from Mr. *Alexander Davidſon*, late Governor of *Madras*, giving an account of ſome *Roman Coins* and *Medals* lately found near *Nelore*, together with a drawing of them, copied from one tranſmitted by Mr. *Davidſon*; which, I imagine, may be acceptable to the *Aſiatic* Society.

I have the honour to be,

Sir,

Your moſt obedient humble ſervant,

S. DAVIS.

Calcutta, March 20, 1788.

Extract of a Letter from Alexander Davidſon, Eſq. Dated Madras, July 12, 1787.

A PEASANT near *Nelore*, about 100 miles north-weſt of *Madras*, was ploughing on the ſide of a ſtony craggy hill: his plough was obſtructed by ſome brick-work: he dug, and diſcovered the remains of a ſmall *Hindu* temple, under which a little pot was found with *Roman* coins and medals of the ſecond century.

He ſold them as old gold; and many no doubt were melted, but the *Nawab Amirul Umara* recovered upwards of thirty of them. This happened while I was governor; and I had the choice of two out of the whole. I choſe an *Adrian* and *Fauſtina*.

Some of the *Trajans* were in good preſervation. Many of the coins could not have been in circulation: they were all of the pureſt gold, and many of them as freſh and beautiful as if they had come from the mint but yeſterday. Some were much defaced and perforated, and had probably been worn as ornaments on the arm, and others pending from the neck.

I ſend you drawings of my two coins, and have no objection to your publiſhing an account of them in the Tranſactions of the *Aſiatic* Society. I received my information reſpecting them from the young [illegible] and if my name be neceſſary to authenticate [illegible] permiſſion to

XX.

ON TWO HINDU FESTIVALS,

AND THE

INDIAN SPHINX.

BY THE LATE COLONEL PEARSE, MAY 12, 1785.

I BEG leave to point out to the Society, that the *Sunday* before laſt was the feſtival of *Bhavani*, which is annually celebrated by the *Gopas*, and all other *Hindus* who keep horned cattle for uſe or profit. On this feaſt they viſit gardens, erect a pole in the fields, and adorn it with pendants and garlands. The *Sunday* before laſt was our *firſt* of *May*, on which the ſame rites are performed by the ſame claſs of people in *England*, where it is well known to be a relique of ancient ſuperſtition in that country: it ſhould ſeem, therefore, that the religion of the eaſt and the old religion of *Britain* had a ſtrong affinity. *Bhavani* has another feſtival; but that is not kept by any one ſet of *Hindus* in particular, and this is appropriated to one claſs of people. This is conſtantly held on the *ninth* of *Baiſac'h*; which does not always fall on our *firſt* of *May*, as it did this year. Thoſe members of the Society who are acquainted with the rules which regulate the feſtivals, may be able to give better information concerning this point. I only mean to point out the reſemblance of the rites performed here and in *England*, but muſt leave abler hands to inveſtigate the matter further, if it ſhould be thought deſerving of the trouble. I find that the feſtival which I have mentioned, is one of the moſt ancient among the *Hindus*.

II. During the *Huli*, when mirth and feſtivity reign among *Hindus* of every claſs, one ſubject of diverſion is to ſend people on errands and expeditions that are to end in diſappointment, and raiſe a laugh at the expence of the perſon ſent. The *Huli* is always in *March*, and the laſt day is the greateſt holiday. All the *Hindus* who are on that day at *Jaggannat'h*, are entitled to certain diſtinctions, which they hold to be of ſuch importance, that I found it expedient to ſtay there till the end of the feſtival; and I am of opinion, and ſo are the reſt of the officers, that I ſaved above five hundred men by the delay. The origin of the *Huli* ſeems loſt in antiquity; and I have not been able to pick up the ſmalleſt account of it.

If the rites of *May-day* ſhow any affinity between the religion of *England* in times paſt and that of the *Hindus* in theſe times, may not the cuſtom of making *April-fools*, on the firſt of that month, indicate ſome traces of the *Huli*? I have never yet heard any account of the origin of the *Engliſh* cuſtom; but it is unqueſtionably very ancient, and is ſtill kept up even in great towns, though leſs in them than in the country. With us it is chiefly confined to the lower claſſes of people; but in *India* high and low join in it; and the late *Shujaul Daulah*, I am told, was very fond of making *Huli* fools, though he was a *Muſelman* of the higheſt rank. They carry it here ſo far, as to ſend letters making appointments, in the names of perſons who, it is known, muſt be abſent from their houſe at the time fixed on; and the laugh is always in proportion to the trouble given.

III. At *Jagannat'h* I found the *Sphinx* of the *Egyptians*; and preſent the Society with a drawing of it. *Murari Pandit*, who was deputy *Faujdar* of *Balaſor*, attended my detachment on the part of the *Mahrattas*.

He is now the principal *Faujdar*, and is much of the gentleman: a man of learning, and very intelligent. From him I learned that the *Sphinx*, here called *Singh*, is to appear at the end of the world, and, as ſoon as he is born, will prey on an elephant. He is, therefore, figured ſeizing an elephant in his claws; and the elephant is made ſmall, to ſhow that the *Singh*, even a moment after his birth, will be very large in proportion to it.

When I told *Murari* that the *Egyptians* worſhipped the bull, and choſe the God by a black mark on his tongue, and that they adored birds and trees, he immediately exclaimed, "their religion then was the ſame "with ours; for we alſo chuſe our *ſacred bulls* by the "*ſame marks*; we reverence the *hanſa*, the *garura*, and "other birds; we reſpect the *pippal* and the *vata* "among trees, and the *tulaſi* among ſhrubs; but as "for onions (which I had mentioned) they are eaten "by low men; and are fitter to be eaten than wor-"ſhipped."

REMARK BY THE PRESIDENT.

Without preſuming to queſtion the authority of *Murari Pandit*, I can only ſay, that ſeveral *Brahmans* now in *Bengal*, have ſeen the figure at *Jagannat'h*, where one of the gates is called *Sinhadwar*; and they aſſure me, that they always conſidered it as a mere repreſentation of a *Lion* ſeizing a young elephant; nor do they know, they ſay, any ſenſe for the word *Sinha* but a *Lion*, ſuch as Mr. *Haſtings* kept near his garden. The *Huli*, called *Holaca* in the *Vedas*, and *P'halgutſava* in common *Sanſcrit* books, is the feſtival of the vernal ſeaſon, or *Nauruz* of the *Perſians*.

XXI.

A SHORT DESCRIPTION OF CARNICOBAR,

BY MR. G. HAMILTON.

COMMUNICATED BY MR. ZOFFANY.

THE iſland, of which I propoſe to give a ſuccinct account, is the northernmoſt of that cluſter in the *Bay* of *Bengal*, which goes by the name of the *Nicobars*. It is low, of a round figure, about forty miles in circumference, and appears at a diſtance as if entirely covered with trees: however, there are ſeveral well cleared and delightful ſpots upon it. The ſoil is a black kind of clay, and marſhy. It produces in great abundance, and with little care, moſt of the tropical fruits, ſuch as pine-apples, plantains, papayas, cocoa-nuts, and areca-nuts; alſo excellent yams, and a root called *cachu*. The only four-footed animals upon the iſland are hogs, dogs, large rats, and an animal of the lizard kind, but large, called by the natives *tolonqui*; theſe frequently carry off fowls and chickens. The only kind of poultry are hens, and thoſe not in great plenty. There are abundance of ſnakes, of many different kinds; and the inhabitants frequently die of their bites. The timber upon the iſland is of many ſorts, in great plenty, and ſome of it remarkably large, affording excellent materials for building or repairing ſhips.

The natives are low in ſtature, but very well made, and ſurprizingly active and ſtrong; they are copper-coloured, and their features have a caſt of the *Malay*; quite the reverſe of elegant. The women, in particular, are extremely ugly. The men cut their hair ſhort, and the women have their heads ſhaved quite bare, and wear no covering but a ſhort petticoat, made of a ſort of ruſh or dry graſs, which reaches half-way down the thigh. This graſs is not interwoven, but hangs round the perſon ſomething like the thatching of a houſe. Such of them as have received preſents

of cloth-petticoats from the ſhips, commonly tie them round immediately under the arms. The men wear nothing but a narrow ſtrip of cloth about the middle, in which they wrap up their privities ſo tight, that there hardly is any appearance of them. The ears of both ſexes are pierced when young, and by ſqueezing into the holes large plugs of wood, or hanging heavy weights of ſhells, they contrive to render them wide and diſagreeable to look at. They are naturally diſpoſed to be good humoured and gay, and are very fond of ſitting at table with *Europeans*, where they eat every thing that is ſet before them; and they eat moſt enormouſly. They do not care much for wine, but will drink bumpers of arrack as long as they can ſee. A great part of their time is ſpent in feaſting and dancing. When a feaſt is held at any village, every one that chuſes goes uninvited, for they are utter ſtrangers to ceremony. At thoſe feaſts they eat immenſe quantities of pork, which is their favourite food. Their hogs are remarkably fat, being fed upon the cocoa-nut kernel and ſea-water: indeed all their domeſtic animals, fowls, dogs, &c. are fed upon the ſame. They have likewiſe plenty of ſmall ſea-fiſh, which they ſtrike very dexterouſly with lances, wading into the ſea about knee-deep. They are ſure of killing a very ſmall fiſh at ten or twelve yards diſtance. They eat the pork almoſt raw, giving it only a haſty grill over a quick fire. They roaſt a fowl, by running a piece of wood through it, by way of ſpit, and holding it over a briſk fire, until the feathers are burnt off, when it is ready for eating, in their taſte. They never drink water; only cocoa-nut milk and a liquor called *ſoura*, which oozes from the cocoa-nut tree after cutting off the young ſprouts or flowers. This they ſuffer to ferment before it is uſed, and then it is intoxicating, to which quality they add much by their method of drinking it, by ſucking it ſlowly through a ſmall ſtraw. After eating, the

young men and women, who are fancifully dreſt with leaves, go to dancing, and the old people ſurround them ſmoking *tobacco* and drinking *ſoura*. The dancers, while performing, ſing ſome of their tunes, which are far from wanting harmony, and to which they keep exact time. Of muſical inſtruments they have only one kind, and that the ſimpleſt. It is a hollow bamboo about 2½ feet long and three inches in diameter; along the outſide of which there is ſtretched from end to end a ſingle ſtring made of the threads of a ſplit cane; and the place under the ſtring is hollowed a little, to prevent it from touching. This inſtrument is played upon in the ſame manner as a guitar. It is capable of producing but few notes; the performer however makes it ſpeak harmoniouſly, and generally accompanies it with the voice.

What they know of phyſic is ſmall and ſimple. I had once occaſion to ſee an operation in ſurgery performed on the toe of a young girl, who had been ſtung by a ſcorpion or centipee. The wound was attended with a conſiderable ſwelling, and the little patient ſeemed in great pain. One of the natives produced the under jaw of a ſmall fiſh, which was long, and planted with two rows of teeth as ſharp as needles: taking this in one hand, and a ſmall ſtick by way of hammer in the other, he ſtruck the teeth three or four times into the ſwelling, and made it bleed freely: the toe was then bound up with certain leaves, and next day the child was running about perfectly well.

Their houſes are generally built upon the beach, in villages of fifteen or twenty houſes each; and each houſe contains a family of twenty perſons and upwards. Theſe habitations are raiſed upon wooden pillars, about ten feet from the ground; they are round, and, having no windows, look like bee-hives, covered with

thatch. The entry is through a trap-door below, where the family mount by a ladder, which is drawn up at night. This manner of building is intended to ſecure the houſes from being infeſted with ſnakes and rats; and for that purpoſe the pillars are bound round with a ſmooth kind of leaf, which prevents animals from being able to mount; beſides which, each pillar has a broad round flat piece of wood near the top of it, the projecting of which effectually prevents the further progreſs of ſuch vermin as may have paſſed the leaf. The flooring is made with thin ſtrips of bamboos, laid at ſuch diſtances from one another as to leave free admiſſion for light and air; and the inſide is neatly finiſhed and decorated with fiſhing-lances, nets, &c.

The art of making cloth of any kind is quite unknown to the inhabitants of this iſland; what they have is got from the ſhips that come to trade in cocoa-nuts. In exchange for their nuts (which are reckoned the fineſt in this part of *India*) they will accept of but few articles; what they chiefly wiſh for is cloth of different colours, hatchets and hanger-blades, which they uſe in cutting down the nuts. Tobacco and arrack they are very fond of; but expect theſe in preſents. They have no money of their own, nor will they allow any value to the coin of other countries, further than as they happen to fancy them for ornaments; the young women ſometimes hanging ſtrings of dollars about their necks. However, they are good judges of gold and ſilver; and it is no eaſy matter to impoſe baſer metals upon them as ſuch.

They purchaſe a much larger quantity of cloth than is conſumed upon their own iſland. This is intended for the *Choury* market. *Choury* is a ſmall iſland to the ſouthward of theirs, to which a large fleet of their boats ſails every year about the month of *November*, to exchange cloth for *canoes*; for they

cannot make theſe themſelves. This voyage they perform by the help of the ſun and ſtars, for they know nothing of the compaſs.

In their diſpoſition there are two remarkable qualities. One is their entire neglect of compliment and ceremony; and the other, their averſion to diſhoneſty. A *Carnicobarian* travelling to a diſtant village upon buſineſs or amuſement, paſſes through many towns in his way without perhaps ſpeaking to any one. If he is hungry or tired, he goes up into the neareſt houſe, and helps himſelf to what he wants, and ſits till he is reſted, without taking the ſmalleſt notice of any of the family, unleſs he has buſineſs or news to communicate. Theft or robbery is ſo very rare amongſt them, that a man going out of his houſe, never takes away his ladder, or ſhuts his door, but leaves it open for any body to enter that pleaſes, without the leaſt apprehenſion of having any thing ſtolen from him.

Their intercourſe with ſtrangers is ſo frequent, that they have acquired in general the barbarous language of the *Portugueſe*, ſo common over *India*; their own tongue has a ſound quite different from moſt others, their words being pronounced with a kind of ſtop, or catch in the throat, at every ſyllable. The few following words will ſerve to ſhew thoſe who are acquainted with other *Indian* languages, whether there is any ſimilitude between them.

A man,	*Kegonia.*	To eat,	*Gnia.*
A woman,	*Kecanna.*	To drink,	*Okk.*
A child,	*Chu.*	Yams,	*Towla.*
To laugh,	*Ayelaur.*	To weep,	*Poing.*
A canoe,	*App.*	A pine-apple,	*Frung.*

A houſe,	*Albanum.*	To ſleep,	*Loom loom.*
A fowl,	*Hayam.*	A dog,	*T'amam.*
A hog,	*Hown.*	Fire,	*T'amia.*
Fiſh,	*Ka.*	Rain,	*Koomra.*

They have no notion of a God; but they believe firmly in the Devil, and worſhip him from fear. In every village there is a high pole erected with long ſtrings of ground-rattans hanging from it, which, it is ſaid, has the virtue to keep him at a diſtance. When they ſee any ſigns of an approaching ſtorm, they imagine that the Devil intends them a viſit; upon which many ſuperſtitious ceremonies are performed. The people of every village march round their own boundaries, and fix up at different diſtances ſmall ſticks ſplit at the top, into which ſplit they put a piece of cocoa-nut, a wiſp of tobacco, and the leaf of a certain plant. Whether this is meant as a peace-offering to the Devil, or a ſcarecrow to frighten him away, does not appear.

When a man dies, all his live ſtock, cloth, hatchets, fiſhing-lances, and in ſhort every moveable thing he poſſeſſed is buried with him; and his death is mourned by the whole village. In one view, this is an excellent cuſtom, ſeeing it prevents all diſputes about the property of the deceaſed amongſt his relations. His wife muſt conform to cuſtom, by having a joint cut off from one of her fingers; and, if ſhe refuſes this, ſhe muſt ſubmit to have a deep notch cut in one of the pillars of her houſe.

I was once preſent at the funeral of an old woman. When we went into the houſe, which had belonged to the deceaſed, we found it full of her female relations; ſome of them were employed in wrapping up the

corpſe in leaves and cloth, and others tearing to pieces all the cloth which had belonged to her. In another houſe hard by, the men of the village, with a great many others from the neighbouring towns, were ſitting drinking *ſoura* and ſmoking tobacco. In the mean time two ſtout young fellows were buſy digging a grave in the ſand near the houſe. When the women had done with the corpſe, they ſet up a moſt hideous howl, upon which the people began to aſſemble round the grave, and four men went up into the houſe to bring down the body; in doing this they were much interrupted by a young man, ſon to the deceaſed, who endeavoured with all his might to prevent them, but finding it in vain, he clung round the body, and was carried to the grave along with it: there, after a violent ſtruggle, he was turned away, and conducted back to the houſe. The corpſe now put into the grave, and the laſhings which bound the legs and arms cut, all the live ſtock which had been the property of the deceaſed, conſiſting of about half a dozen hogs and as many fowls, was killed, and flung in above it. A man then approached with a bunch of leaves ſtuck upon the end of a pole, which he ſwept two or three times gently along the corpſe, and then the grave was filled up. During the ceremony, the women continued to make the moſt horrible vocal concert imaginable: the men ſaid nothing. A few days afterwards, a kind of monument was erected over the grave, with a pole upon it, to which long ſtrips of cloth of different colours were hung.

Polygamy is not known among them; and their puniſhment of adultery is not leſs ſevere than effectual. They cut, from the man's offending member a piece of the foreſkin, proportioned to the frequent commiſſion or enormity of the crime.

There ſeems to ſubſiſt among them a perfect equality. A few perſons, from their age, have a little

more reſpect paid to them; but there is no appearance of authority one over another. Their ſociety ſeems bound rather by mutual obligations continually conferred and received: the ſimpleſt and beſt of all ties.

The inhabitants of the *Andamans* are ſaid to be *Cannibals*. The people of *Carnicobar* have a tradition among them, that ſeveral canoes came from *Andaman* many years ago, and that the crews were all armed, and committed great depredations, and killed ſeveral of the *Nicobarians*. It appears at firſt remarkable, that there ſhould be ſuch a wide difference between the manners of the inhabitants of iſlands ſo near to one another; the *Andamans* being ſavage *Cannibals*, and the others, the moſt harmleſs inoffenſive people poſſible. But it is accounted for by the following hiſtorical anecdote, which, I have been aſſured, is matter of fact. Shortly after the *Portugueſe* had diſcovered the paſſage to *India* round the *Cape of Good Hope*, one of their ſhips on board of which were a number of *Mozambique* negroes, was loſt on the *Andaman* iſlands, which were till then uninhabited. The blacks remained on the iſland, and ſettled there: the *Europeans* made a ſmall ſhallop, in which they ſailed to *Pegu*. On the other hand, the *Nicobar* iſlands were peopled from the oppoſite main and the coaſt of *Pegu*; in proof of which, the *Nicobar* and *Pegu* languages are ſaid, by thoſe acquainted with the latter, to have much reſemblance.

XXII.

THE DESIGN OF A TREATISE ON THE PLANTS OF INDIA.

BY THE PRESIDENT.

THE greateſt, if not the only, obſtacle to the progreſs of knowledge in theſe provinces, except in thoſe branches of it which belong immediately to our ſeveral profeſſions, is the want of leiſure for general reſearches; and, as *Archimedes*, who was happily maſter of his time, had not *ſpace* enough to move the greateſt weight with the ſmalleſt force, thus we, who have ample ſpace for our inquiries, really want *time* for the purſuit of them. "Give me a place to "ſtand on, ſaid the great mathematician, and I will "move the whole earth:" *Give us time*, we may ſay, *for our inveſtigations, and we will transfer to* Europe *all the ſciences, arts, and literature of* Aſia. "Not to have deſpaired," however, was thought a degree of merit in the *Roman* General, even though he was defeated; and having ſome hope that others may occaſionally find more leiſure than it will ever, at leaſt in this country, be my lot to enjoy, I take the liberty to propoſe a work, from which very curious information, and poſſibly very ſolid advantage, may be derived.

Some hundreds of plants, which are yet imperfectly known to *European* botaniſts, and with the virtues of which they are wholly unacquainted, grow wild on the plains and in the foreſts of *India*. The *Amarcoſh*, an excellent vocabulary of the *Sanſcrit* language, contains in one chapter the names of about three hundred medicinal vegetables; the *Medini* may com-

prize many more; and the *Dravyabidana*, or *Dictionary of Natural Productions*, includes, I believe, a far greater number; the properties of which are distinctly related in medical tracts of approved authority. Now the first step, in compiling a treatise on the plants of *India*, should be to write their true names in *Roman* letters, according to the most accurate orthography, and in *Sanscrit*, preferably to any vulgar dialect; because a learned language is fixed in books, while popular idioms are in constant fluctuation, and will not perhaps, be understood a century hence by the inhabitants of these *Indian* territories, whom future botanists may consult on the common appellations of trees and flowers. The childish denominations of plants from the persons who first described them, ought wholly to be rejected; for *Champaca* and *Hinna* seem to me not only more elegant, but far properer designations of an *Indian* and an *Arabian* plant, than *Michelia* and *Lawsonia*; nor can I see without pain, that the great *Swedish* botanist considered it as *the supreme and only reward of labour* in this part of natural history, to preserve a name by hanging it on a blossom, and that he declared this mode of promoting and adorning botany, worthy of being *continued with holy reverence*, though so high an honour, he says, *ought to be conferred with chaste reserve, and not prostituted for the purpose of conciliating the good-will, or eternizing the memory, of any but his chosen followers; no, not even of saints.* His list of *an hundred and fifty* such names, clearly shows that his excellent works are the true basis of his just celebrity, which would have been feebly supported by the stalk of *Linnæa*. From what proper name the *Plantain* is called *Musa*, I do not know; but it seems to be the *Dutch* pronunciation of the *Arabic* word for that vegetable, and ought not, therefore, to have appeared in his list; though, in my opinion, it is the only rational name in the muster-roll. As to the system of *Linnæus*, it is the system of Nature, subordinate indeed to the beautiful arrangement of *natural*

orders, of which he hath given a rough ſketch, and which may hereafter, perhaps, be complete: but the diſtribution of vegetables into *claſſes*, according to the number, length, and poſition of the ſtamens and piſtils, and of thoſe *claſſes* into *kinds* and *ſpecies*, according to certain marks of diſcrimination, will ever be found the cleareſt and moſt convenient of methods, and ſhould therefore be ſtudiouſly obſerved in the work which I now ſuggeſt; but I muſt be forgiven, if I propoſe to reject the *Linnæan* appellations of the twenty-four *claſſes*, becauſe, although they appear to be *Greek* (and, if they really were ſo, that alone might be thought a ſufficient objection) yet in truth they are not *Greek*, nor even formed by analogy to the language of *Grecians*; for *Polygamos*, *Monandros*, and the reſt of that form, are both maſculine and feminine; *Polyandra*, in the abſtract, never occurs, and *Polyandrion* means a public cemetery; *diœcia* and *hiœcus* are not found in books of authority; nor, if they were, would they be derived from *dis*, but from *dia*, which would include the *triœcia*; let me add that the *twelfth* and *thirteenth* claſſes are ill diſtinguiſhed by their appellations, independently of other exceptions to them, ſince the real diſtinction between them conſiſts not ſo much in the *number* of their ſtamens, as in the *place* where they are inſerted; and that the *fourteenth* and *fifteenth* are not more accurately diſcriminated by two words formed in defiance of grammatical analogy, ſince there are but *two* powers, or two *diverſities of length* in each of thoſe claſſes. *Calycopolyandros* might, perhaps, not inaccurately denote a flower of the *twelfth* claſs; but ſuch a compound would ſtill ſavour of barbariſm or pedantry; and the beſt way to amend ſuch a ſyſtem of words is to efface it, and ſupply its place by a more ſimple nomenclator, which may eaſily be found. Numerals may be uſed for the *eleven* firſt claſſes, the former of two numbers being always appropriated to the *ſtamens*, and the latter to the *piſtils*. Short phraſes, as *on the*

calyx or *calice*, *in the receptacle*, *two long*, *four long from one base*, *from two* or *many bases*, *with anthers connected*, *on the pistils*, *in two flowers*, *in two distinct plants*, *mixed*, *concealed*, or the like, will anſwer every purpoſe of diſcrimination; but I do not offer this as a perfect ſubſtitute for the words, which I condemn. The allegory of *sexes* and *nuptials*, even if it were complete, ought, I think, to be diſcarded, as unbecoming the gravity of men, who, while they ſearch for truth, can have no buſineſs to inflame their imaginations; and, while they profeſs to give deſcriptions, have nothing to do with metaphors. Few paſſages in *Aloiſia*, the moſt impudent book ever compoſed by man, are more wantonly indecent than the hundred-forty-ſixth number of the *Botanical Philoſophy*, and the broad comment of its grave author,- who *dares*, like *Octavius* in his epigram, *to ſpeak with* Roman *ſimplicity*; nor can the *Linnæan* deſcription of the *Arum*, and many other plants, be read in *Engliſh* without exciting ideas which the occaſion does not require. Hence it is that no well-born and well-educated woman can be adviſed to amuſe herſelf with botany as it is now explained, though a more elegant and delightful ſtudy, or one more likely to aſſiſt and embelliſh other female accompliſhments, could not poſſibly be recommended.

When the *Sanſcrit* names of the *Indian* plants have been correctly written in a large paper-book, one page being appropriated to each, the freſh plants themſelves, procured in their reſpective ſeaſons, muſt be conciſely, but accurately, *claſſed* and *deſcribed*; after which their ſeveral *uſes* in medicine, diet, or manufactures, may be collected with the aſſiſtance of *Hindu* phyſicians, from the medical books in *Sanſcrit*, and their accounts either diſapproved or eſtabliſhed by repeated experiments, as faſt as they can be made with exactneſs.

By way of example, I annex the deſcriptions of five *Indian* plants; but am unable, at this ſeaſon, to re-examine them, and wholly deſpair of leiſure to exhibit others, of which I have collected the names, and moſt of which I have ſeen in bloſſom.

I. MUCHUCUNDA.

Twenty, from One Baſe.

Cal. Five-parted, thick; leafleats oblong.
Cor. Five petals, oblong.
Stam. From twelve to fifteen, rather long, fertile; five ſhorter, ſterile. In ſome flowers, the *unprolific* ſtamens longer.
Piſt. *Style* cylindric.
Peric. A capſule, with five cells, many-ſeeded.
Seeds. Roundiſh, compreſſed, winged.
Leaves. Of many different ſhapes.
Uſes. The quality refrigerant.

One flower, ſteeped a whole night in a glaſs of water, forms a cooling mucilage, of uſe in virulent gonorrhœas. The *Muchucunda*, called alſo *Pichuca*, is exquiſitely fragrant: its calyx is covered with an odoriferous duſt; and the dried flowers in fine powder, taken as ſnuff, are ſaid, in a *Sanſcrit* book, almoſt inſtantaneouſly to remove a nervous head-ach.

Note. This plant differs a little from the *Pentapetes* of *Linnæus*.

II. BILVA, OR MALURA.

Many on the Receptacle, and One.

Cal. Four or five cleft beneath.

Cor. Four or five petals; moſtly reflex.

Stam. Forty to forty-eight filaments; anthers moſtly erect.

Piſt. *Germ*, roundiſh; *Style* ſmooth, ſhort; *Stigma* clubbed.

Peric. A ſpheroidal berry, very large; many-ſeeded.

Seeds. Toward the ſurface ovate, in a pellucid mucus.

Leaves. Ternate; common petiole long; leaflets ſubovate; obtuſely notched with ſhort petioles; ſome almoſt lanced.

Stem. Armed with ſharp thorns.

Uſes. The fruit nutritious, warm, cathartic; in taſte delicious, in fragrance exquiſite: its aperient and deterſive quality, and its efficacy in removing habitual coſtiveneſs, having been proved by conſtant experience. The mucus of the ſeed is, for ſome purpoſes, a very good cement.

Note. This fruit is called *Srip'hala*, becauſe it ſprang, ſay the *Indian* poets, from the milk of *Sri*, the Goddeſs of Abundance, who beſtowed it on mankind at the requeſt of *Iſwara*, whence he alone wears a chaplet of *Bilva* flowers: to him only the *Hindus* offer them; and, when they ſee any of them fallen on the ground, they take them up with reverence, and carry them to his temple. From the firſt bloſſom of this plant, that I could inſpect, I had imagined that it belonged to the ſame claſs with the *Durio*, becauſe the filaments appeared to be diſtributed in five ſets; but in all that I have ſince examined, they are perfectly diſtinct.

III. SRINGATACA.

Four and One.

Cal. Four cleft, with a long peduncle above.

Cor. Four petals.

Stam. Anthers kidney-ſhaped.

Piſt. *Germ* roundiſh; *Style* long, as the filaments; *Stigma* clubbed.

Seed. A *Nut* with four oppoſite angles (two of them *ſharp* thorns) formed by the *Calyx*.

Leaves. Thoſe which float on the water are rhomboidal; the two upper ſides unequally notched, the two lower, right lines. Their petioles buoyed up by ſpindle-ſhaped ſpongy ſubſtances, not bladders.

Root. Knotty, like coral.

Uſes. The freſh kernel, in ſweetneſs and delicacy, equals that of the filbert. A mucus, ſecreted by minute glands, covers the wet leaves, which are conſidered as cooling.

Note. It ſeems to be the floating *Trapa* of *Linnæus*.

IV. PUTICARAJA.

Ten and One.

Cal. Five-cleft.

Cor. Five equal petals.

Peric. A thorny legumen; two ſeeds.

Leaves. Oval, pinnated.

Stem. Armed.

Uſes. The ſeeds are very bitter, and, perhaps, tonic; ſince one of them, bruiſed and given in two doſes, will, as the *Hindus* aſſert, cure an intermittent fever.

V. MADHUCA. *(See Vol. I. page 300.)*

Many, *not* on the Receptacle, and One.

Cal. *Perianth* four or five-leaved.

Cor. One-petaled. *Tube* inflated, fleſhy. *Border* nine, or ten, parted.

Stam. *Anthers* from twelve to twenty-eight, erect, acute, ſubvillous.

Piſt. *Germ* roundiſh; *Style* long, awl-ſhaped.

Peric. A *Drupe*, with two or three *Nuts?*

Leaves. Oval, ſomewhat pointed.

Uſes. The *tubes* eſculent, nutritious; yielding, by diſtillation, an inebriating ſpirit, which, if the ſale of it were duly reſtrained by law, might be applied to good purpoſes. A uſeful oil is expreſſed from the ſeed.

Note. It reſembles the *Baſſia* of the *Koenig*.

Such would be the method of the work which I recommend; but even the ſpecimen which I exhibit, might, in ſkilful hands, have been more accurate. Engravings of the plants may be annexed; but I have more than once experienced, that the beſt anatomical and botanical prints give a very inadequate, and ſometimes a very falſe notion of the objects which they were intended to repreſent. As we learn a new language by reading approved compoſitions in it with the aid of a Grammar and Dictionary, ſo we can only ſtudy with effect the natural hiſtory of vegetables by analyſing the plants themſelves with the *Philoſophia Botanica*, which is the *Grammar*, and the *Genera et Species Plantarum*, which may be conſidered as the *Dictionary* of that beautiful language, in which Nature would teach us what plants we muſt avoid as noxious, and what we muſt cultivate as ſalutary; for that the qualities of plants are *in ſome degree* connected with the *natural orders* and *claſſes* of them, a number of inſtances would abundantly prove.

XXIII.

ON THE DISSECTION OF THE PANGOLIN,

In a Letter to General Carnac
from Adam Burt, Esq.

COMMUNICATED BY THE GENERAL.

SIR,

IN compliance with your desire, I most willingly do myself the honour to present to you my observations and reflections on the dissection of one of those animals, of which we have a print, with a very short account, in the *First Volume* of the *Transactions of the Asiatic Society*. The animal, from which that likeness has been taken, was sent by Mr. *Leslie*, from *Chitra*, to the President Sir *William Jones*. It is distinguished in the *Transactions* by a name, which I do not at present remember; but probably the animal is of the same genus with the *Manis*, as described in the former edition of the *Encyclopædia Britannica*, or perhaps, not different from the *Pangolin* of *Buffon*.

The representation of this animal in the *Memoirs of the Asiatic Society*, makes it unnecessary for me to enter into any general description of its external figure and appearance. There are on each foot five claws, of which the outer and inner are small when compared with the other three. There are no distinct toes; but each nail is moveable by a joint at its root. This creature is extremely inoffensive: it has *no teeth*; and its feet are unable to grasp. Hence it would appear that Nature, having furnished it with a coat of mail for its protection, has, with some regard to justice, denied it the powers of acting with hostility against

its fellow-creatures. The nails are well adapted for digging in the ground; and the animal is so dexterous in eluding its enemies, by concealing itself in holes and among rocks, that it is extremely difficult to procure one.

The upper jaw is covered with a cross cartilaginous ridge, which though apparently not at all suited to any purposes of mastication, may, by increasing the surface of the palate, extend the sense of taste. The œsophagus admitted my fore-finger with ease. The tongue at the bottom of the mouth is nearly about the size of the little finger, from whence it tapers to a point. The animal at pleasure protrudes this member a great way from the mouth. The tongue arises from the ensiform cartilage, and the contiguous muscles of the belly, and passes in form of a round distinct muscle from over the stomach, through the thorax, immediately under the sternum; and interior to the wind-pipe in the throat. When dissected out, the tongue could be easily elongated so as to reach more than the length of the animal, exclusive of its tail. There is a cluster of salivary glands seated around the tongue, as it enters the mouth. These will necessarily be compressed by the action of the tongue, so as occasionally to supply a plentiful flow of their secretion.

The stomach is *cartilaginous*, and analogous to that of the gallinaceous tribe of birds. It was filled with small stones and gravel, which in this part of the country, are almost universally calcareous. The inner surface of the stomach was rough to the feel, and formed into folds, the interstices of which were filled with a frothy secretion. The guts were filled with a sandy pulp, in which, however, were interspersed a few distinct small stones. No vestiges of any animal or vegetable food could be traced in the whole *primæ viæ*. The gall-bladder was distended with a

fluid, resembling in colour and consistence the dregs of beer.

The subject was a female: its dugs were two, seated on the breast. The uterus and organs of generation were evidently those of a viviparous animal.

Forcibly struck with the phenomena which this quadruped exhibited, my imagination at once overleaped the boundaries by which science endeavours to circumscribe the productions and the ways of Nature; and believing with *Buffon*, *que tout ce qui peut etre est*, I did not hesitate to conjecture that this animal might possibly derive its nourishment from mineral substances. This idea I accordingly hazarded in an address to Colonel *Kyd*. The spirit of inquiry, natural to that gentleman, could be ill satisfied by ideas thrown out apparently at random; and he soon called on me to explain my opinion, and its foundation.

Though we have perhaps no clear idea of the manner in which vegetables extract their nourishment from earth, yet the fact being so, it may not be unreasonable to suppose that some animal may derive nutriment by a process somewhat similar. It appears to me, that facts produced by *Spallanzani* directly invalidate the experiments, from which he has drawn the inference, that fowls swallow stones merely from stupidity; and that such substances are altogether unnecessary to those animals. He reared fowls, without permitting them ever to swallow sand or stones; but he also established the fact, that carnivorous animals may become frugivorous; and herbivorous animals may come to live on flesh. A wood-pidgeon he brought to thrive on putrid meat. The experiment on fowls, then, only corroborates the proof, that we have it in our power by habits to alter the natural constitution of animals. Again, the eminent investigator of truth found, that fowls died when fed

on ſtones alone; but ſurely that fact is far ſhort of proving that ſuch ſubſtances are not agreeable to the original purpoſes of nature in the digeſtive proceſs of theſe animals. When other ſubſtances ſhall have been detected in the ſtomach of this animal, my inference, from what I have ſeen, muſt neceſſarily fall to the ground. But if, like other animals with muſcular and cartilaginous ſtomachs, this ſingular quadruped conſumes grain, it muſt be ſurpriſing that no veſtige of ſuch food was found preſent in the whole alimentary canal, ſince in that thinly inhabited country, the wild animals are free to feed without intruſion from man: nor can it be inferred from the ſtructure of the ſtomach, that this animal lives on ants or on inſects. Animals devoured as food, though of conſiderable ſize and ſolidity, with a proportionably ſmall extent of ſurface to be acted on by the gaſtric juice and the action of the ſtomach, are readily diſſolved and digeſted by animals poſſeſſing not a cartilaginous, but a membranaceous ſtomach; as for inſtance, a frog in that of a ſnake.

In the ſtomach many minerals are ſoluble, and the moſt active things which we can ſwallow. Calcareous ſubſtances are readily acted on. Dr. *Prieſtley* has aſked, "May not phlogiſtic matter be the moſt eſ-"ſential part of the food and ſupport of both vege-"table and animal bodies?" I confeſs, that Dr. *Prieſtley*'s finding cauſe to propoſe the queſtion, inclines me to ſuppoſe that the affirmative to it may be true. Earth ſeems to be the baſis of all animal matter. The growth of the bones muſt be attended with a conſtant ſupply; and in the human ſpecies there is a copious diſcharge of calcareous matter thrown out by the kidneys and ſalivary glands. May not the quadruped in queſtion derive phlogiſton from earth? ſalt, from mineral ſubſtances? And, as it is not deprived of the power of drinking water,

what elſe is neceſſary to the ſubſiſtence of his corporeal machine.

Conſidering the ſcaly covering of this animal, we may conceive that it may be at leaſt neceſſary for its exiſtence, on that account, to imbibe a greater proportion of earth than is neceſſary to other animals. It may deſerve conſideration, that birds are covered with feathers, which in their conſtituent principles approach to the nature of horn and bone. Of theſe animals the gallinaceous tribe ſwallow ſtones; and the carnivorous take in the feathers and bones of their prey: the latter article is known to be ſoluble in the membranaceous ſtomachs; and hence is a copious ſupply of the earthy principles. In truth, I do not know that any thing is ſoluble in the ſtomach of animals, which may not be thence abſorbed into their circulating ſyſtem; and, nothing can be ſo abſorbed without affecting the whole conſtitution.

What I have here ſtated is all that I could advance to the Colonel; but my opinion has been ſince not a little confirmed, by obſerving the report of experiments by M. *Bruquatelli* of *Pavia*, on the authority of M. *Crell*, by which we learn, that ſome birds have ſo great a diſſolvent power in the gaſtric juice, as to diſſolve in their ſtomachs flints, rock-cryſtal, calcareous ſtones, and ſhells.

I beg only farther to obſerve, that ſome things in *Buffon*'s deſcription of the Pangolin, not apparently quite applicable to this animal, might have been owing to his deſcription being only from the view of a dried preparation, in which the organs of generation would be obliterated, and the dugs ſhrivelled away ſo as to be imperceptible; elſe that elegant philoſopher could not have aſſerted that, " *tous les animaux quadrupedes, qui ſont couverts d'ecailles, ſont ovipares.*"

Excuſe my prolixity, which is only in me the neceſſary attendant of my ſuperficial knowledge of things. In ingenuouſneſs, however, I hope that I am not inferior to any man: and I am proud to ſubſcribe myſelf,

Sir,

Your moſt obedient humble ſervant,

ADAM BURT.

Gya, September 14, 1789.

A Letter from Doctor Anderson to Sir William Jones.

DEAR SIR,

THE male *Lac* inſect having hitherto eſcaped the obſervation of naturaliſts, I ſend the encloſed deſcription, made by Mr. *William Roxburgh*, ſurgeon on this eſtabliſhment, and botaniſt to the Honourable Company, in hopes you will give it a place in the publication of your Society, as Mr. *Roxburgh*'s diſcovery will bring Lac a genus into the claſs Hemiptera of *Linnæus*.

I am, with eſteem,

Dear Sir,

Your very obedient ſervant,

JAMES ANDERSON.

Fort St. George, January 2, 1790.

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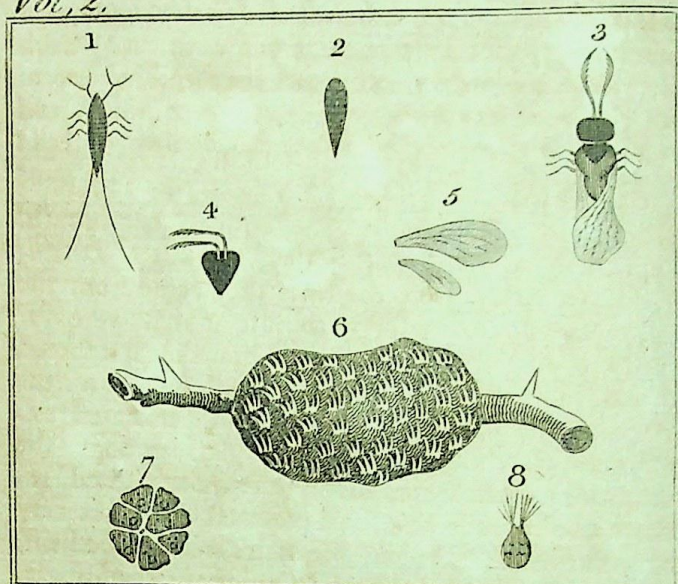
XXIV.

ON THE LACSHA, OR LAC INSECT.

BY MR. WILLIAM ROXBURGH.

SOME pieces of very fresh-looking lac adhering to small branches of *mimosa cinerea*, were brought me from the mountains on the 20th of last month. I kept them carefully, and to-day, the 4th of *December*, fourteen days from the time they came from the hills, myriads of exceedingly minute animals were observed creeping about the lac and branches it adhered to, and more still issuing from small holes over the surface of the cells: other small and perforated excrescences were observed with a glass amongst the perforations, from which the minute insects issued, regularly two to each hole, and crowned with some very fine white hairs. When the hairs were rubbed off, two white spots appeared. The animals, when single, ran about pretty briskly; but in general they were so numerous as to be crowded over one another. The body is oblong, tapering most towards the tail, below plain, above convex, with a double, or flat margin: laterally on the back part of the thorax are two small tubercles, which may be the eyes: the body behind the thorax is crossed with twelve rings; legs six; feelers (antennæ) half the length of the body, jointed, hairy, each ending in two hairs as long as the antennæ; rump, a white point between two terminal hairs, which are as long as the body of the animal; the mouth I could not see. On opening the cells, the substance that they were formed of cannot be better described, with respect to appearance, than by saying it is like the transparent amber that beads are made of: the external covering of the cells may be about half a line thick, is remarkably strong and able to resist injuries; the partitions are much thinner; the cells are in general

irregular ſquares, pentagons, and hexagons, about an eighth of an inch in diameter, and ¼ deep; they have no communication with each other: all theſe I opened during the time the animals were iſſuing, contained in one-half a ſmall bag filled with a thick red jelly-like liquor, replete with what I take to be eggs; theſe bags, or utriculi, adhere to the bottom of the cells, and have each two necks, which paſs through perforations in the external coat of the cells, forming the fore-mentioned excreſcences, and ending in ſome very fine hairs. The other half of the cells have a diſtinct opening, and contain a white ſubſtance, like ſome few filaments of cotton rolled together, and numbers of the inſects themſelves ready to make their exit. Several of the ſame inſects I obſerved to have drawn up their legs, and to lie flat; they did not move on being touched, nor did they ſhow any ſigns of life with the greateſt irritation.

December 5. The ſame minute hexapedes continue iſſuing from their cells in numbers; they are more lively, of a deepened red colour, and fewer of the motionleſs ſort. To-day I ſaw the mouth; it is a flattened point, about the middle of the breaſt, which the little animal projects on being compreſſed.

December 6. The male inſects I have found to-day. A few of them are conſtantly running among the females moſt actively: as yet they are ſcarce more, I imagine, than one to 5000 females, but twice their ſize. The head is obtuſe; eyes black, very large; antennæ clavated, feathered, about ⅔ the length of the body; below the middle an articulation, ſuch as thoſe in the legs; colour between the eyes a beautiful ſhining green; neck very ſhort; body oval, brown; abdomen oblong, the length of body and head; legs ſix; wings membranaceous, four, longer than the body, fixed to the

ſides of the thorax, narrow at their inſertions, growing broader for two-thirds of their length, then rounded; the anterior pair is twice the ſize of the poſterior; a ſtrong fibre runs along their anterior margins; they lie flat, like wings of a common fly, when it walks or reſts; no hairs from the rump; it ſprings moſt actively to a conſiderable diſtance on being touched; mouth in the under part of the head; maxillæ tranſverſe. To-day the female inſects continue iſſuing in great numbers, and move about as on the 4th.

December 7. The ſmall red inſects ſtill more numerous, and move about as before: winged inſects, ſtill very few, continue active. There have been freſh leaves and bits of the branches of both *mimoſa cinerea* and *corinda* put into the wide mouthed bottle with them: they walk over them indifferently, without ſhowing any preference, nor inclination to work nor copulate. I opened a cell whence I thought the winged flies had come, and found ſeveral, eight or ten, more in it, ſtruggling to ſhake off their incumbrances: they were in one of thoſe utriculi mentioned on the 4th, which ends in two mouths, ſhut up with fine white hairs, but one of them was open for the exit of the flies; the other would no doubt have opened in due time: this utriculus I found now perfectly dry, and divided into cells by exceeding thin partitions. I imagine, before any of the flies made their eſcape, it might have contained about twenty. In theſe minute cells with the living flies, or whence they had made their eſcape, were ſmall dry dark coloured compreſſed grains, which may be the dried excrements of the flies.

Note by the President.

THE *Hindus* have six names for *Lac*; but they generally call it *Lacsha*, from the *multitude* of small insects, who, as they believe, discharge it from their stomachs, and at length destroy the tree on which they form their colonies. A fine *Pippala* near *Crishnanagar*, is now almost wholly destroyed by them,

XXV.

THE SEVENTH ANNIVERSARY DISCOURSE,

DELIVERED 25 FEBRUARY, 1790.

BY THE PRESIDENT.

Gentlemen,

ALTHOUGH we are at this moment confiderably nearer to the frontier of *China* than to the fartheft limit of the *Britiſh* dominions in *Hinduſtan*, yet the firft ftep that we fhould take in the philofophical journey, which I propofe for your entertainment at the prefent meeting, will carry us to the utmoft verge of the habitable globe known to the beft geographers of *Old Greece* and *Egypt*; beyond the boundary of whofe knowledge we fhall difcern from the heights of the northern mountains an empire nearly equal in furface to a fquare of fifteen degrees; an empire, of which I do not mean to affign the precife limits, but which we may confider, for the purpofe of this differtation, as embraced on two fides by *Tartary* and *India*, while the ocean feparates its other fides from various *Afiatic* ifles of great importance in the commercial fyftem of *Europe*. Annexed to that immenfe track of land is the peninfula of *Corea*, which a vaft oval bafon divides from *Nifon*, or *Japan*, a celebrated and imperial ifland, bearing in arts and in arms, in advantage of fituation, but not in felicity of government, a pre-eminence among eaftern kingdoms analogous to that of *Britain* among the nations of the weft. So many climates are included in fo prodigious an æra, that while the principal emporium of *China* lies nearly under the tropic, its metropolis enjoys the temperature of *Sa-*

markand: ſuch too is the diverſity of ſoil in its fifteen provinces, that, while ſome of them are exquiſitely fertile, richly cultivated, and extremely populous, others are barren and rocky, dry and unfruitful, with plains as wild or mountains as rugged as any in *Scythia*, and thoſe either wholly deſerted, or peopled by ſavage hordes, who, if they be not ſtill independent, have been very lately ſubdued by the perfidy, rather than the valour, of a monarch, who has perpetuated his own breach of faith in a *Chineſe* poem, of which I have ſeen a tranſlation.

The word *China*, concerning which I ſhall offer ſome new remarks, is well known to the people whom we call the *Chineſe*; but they never apply it (I ſpeak of the learned among them) to themſelves or to their country. Themſelves, according to Father *Viſdelou*, they deſcribe as the *people of Han*, or of ſome other illuſtrious family, by the memory of whoſe actions they flatter their national pride; and their country they call *Chum-cue*, or the *Central Kingdom*, repreſenting it in their ſymbolical characters by a parallelogram exactly biſſected. At other times they diſtinguiſh it by the words *Tien-hia*, or *What is under Heaven*; meaning *all that is valuable on earth*. Since they never name themſelves with moderation, they would have no right to complain, if they knew that *European* authors have ever ſpoken of them in the extremes of applauſe or of cenſure. By ſome they have been extolled as the oldeſt and the wiſeſt, as the moſt learned and moſt ingenious of nations; whilſt others have derided their pretenſions to antiquity, condemned their government as abominable, and arraigned their manners as inhuman, without allowing them an element of ſcience, or a ſingle art for which they have not been indebted to ſome more ancient and more civilized race of men. The truth perhaps lies, where we uſually find it,

between the extremes; but it is not my design to accuse or to defend the *Chinese*, to depress or to aggrandize them: I shall confine myself to the discussion of a question connected with my former discourses, and far less easy to be solved than any hitherto started: "Whence came the singular people, who long had "governed *China*, before they were conquered by the "*Tartars?*" On this problem (the solution of which has no concern, indeed, with our political or commercial interests, but a very material connection, if I mistake not, with interests of a higher nature) four opinions have been advanced, and all rather peremptorily asserted than supported by argument and evidence. By a few writers it has been urged, that the *Chinese* are an original race, who have dwelt for ages, if not from eternity, in the land which they now possess; by others, and chiefly by the missionaries, it is insisted that they sprang from the same stock with the *Hebrews* and *Arabs*; a third assertion is that of the *Arabs* themselves and of M. *Pauw*, who hold it indubitable, that they were originally *Tartars*, descending in wild clans from the steeps of *Imaus*; and a fourth, at least as dogmatically pronounced as any of the preceding, is that of the *Brahmens*, who decide, without allowing any appeal from their decision, that the *Chinas* (for so they are named in *Sanscrit*) were *Hindus* of the *Cshatriya*, or military class, who, abandoning the privileges of their tribe, rambled in different bodies to the north-east of *Bengal*; and, forgetting by degrees the rites and religion of their ancestors, established separate principalities, which were afterwards united in the plains and valleys which are now possessed by them. If any one of the three last opinions be just, the first of them must necessarily be relinquished; but of those three, the first cannot possibly be sustained, because it rests on no firmer support than a foolish remark, whether true or false, that *Sem* in *Chinese* means *life* and *procreation*; and because a tea-plant is not more different

from a palm than a *Chinese* from an *Arab*. They are men, indeed, as the tea and the palm are vegetables; but human sagacity could not, I believe, discover any other trace of resemblance between them. One of the *Arabs*, indeed (an account of whose voyage to *India* and *China* has been translated by *Renaudot*) thought the *Chinese* not handsomer (according to his ideas of beauty) than the *Hindus*; but even more like his own countrymen in features, habiliments, carriage, manners, and ceremonies: and this may be true, without proving an actual resemblance between the *Chinese* and *Arabs*, except in dress and complexion. The next opinion is more connected with that of the *Brahmens* than M. *Pauw*, probably, imagined; for, though he tells us expressly that by *Scythians* he meant the *Turks*, or *Tartars*, yet the Dragon on the standard, and some other peculiarities, from which he would infer a clear affinity between the old *Tartars* and the *Chinese*, belonged indubitably to those *Scythians* who are known to have been *Goths*; and the *Goths* had manifestly a common lineage with the *Hindus*, if his own argument, in the preface to his *Researches on the Similarity of Language* be, as all men agree that it is, irrefragable. That the *Chinese* were anciently of a *Tartarian* stock, is a proposition which I cannot otherwise disprove for the present, than by insisting on the total dissimilarity of the two races in manners and arts, particularly in the fine arts of imagination, which the *Tartars*, by their own account, never cultivated; but if we show strong grounds for believing that the first *Chinese* were actually of an *Indian* race, it will follow that M. *Pauw* and the *Arabs* are mistaken. It is to the discussion of this new and, in my opinion, very interesting point, that I shall confine the remainder of my discourse.

In the *Sanscrit Institutes* of civil and religious duties, revealed, as the *Hindus* believe, by *Menu*, the son of *Brahma*, we find the following curious passage:

" Many families of the military clafs having gra-
" dually abandoned the ordinances of the *Veda*, and
" the company of *Brahmens*, lived in a ftate of degra-
" dation ; as the people of *Pundraca* and *Odra*, thofe
" of *Dravira* and *Camboja*, the *Yavanas* and *Sacas*,
" the *Paradas* and *Pahlavas*, the *Chinas*, and fome
" other nations." A full comment on his text would here be fuperfluous ; but, fince the teftimony of the *Indian* author, who, though certainly not a divine perfonage, was as certainly a very ancient lawyer, moralift, and hiftorian, is direct and pofitive, difinterefted and unfufpected, it would, I think, decide the queftion before us, if we could be fure that the word *China* fignified a *Chinefe*, as all the *Pandits*, whom I have feparately confulted, affert with one voice. They affure me, that the *Chinas* of *Menu* fettled in a fine country to the north-eaft of *Gaur*, and to the eaft of *Camarup* and *Nepal* ; that they have long been, and ftill are, famed as ingenious artificers ; and that they had themfelves feen old *Chinefe* idols, which bore a manifeft relation to the primitive religion of *India* before *Budha*'s appearance in it. A well-informed *Pandit* fhowed me a *Sanfcrit* book in *Cafhmirian* letters, which, he faid, was revealed by *Siva* himfelf, and entitled *Sactifangama* : he read to me a whole chapter of it on the heterodox opinions of *Chinas*, who were divided, fays the author, into near two hundred clans. I then laid before him a map of *Afia* ; and, when I pointed to *Cafhmir*, his own country, he inftantly placed his finger on the north-weftern provinces of *China*, where the *Chinas*, he faid, firft eftablifhed themfelves ; but he added, that *Mahachina*, which was alfo mentioned in his book, extended to the eaftern and fouthern oceans. I believe, neverthelefs, that the *Chinefe* empire, as we now call it, was not formed when the laws of *Menu* were collected ; and for this belief, fo repugnant to the general opinion, I am bound to offer my reafons. If the outline of hiftory and chronology for the laft two thoufand years be correctly traced (and we muft

be hardy sceptics to doubt it) the poems of *Calidas* were composed before the beginning of our era. Now it is clear, from internal and external evidence, that the *Ramayan* and *Mahabharat* were considerably older than the productions of that poet; and it appears from the style and metre of the *Dherma Sastra*, revealed by *Menu*, that it was reduced to writing long before the age of *Valmic* or *Vyasa*, the second of whom names it with applause. We shall not, therefore, be thought extravagant if we place the compiler of those laws between a thousand and fifteen hundred years before *Christ*; especially as *Buddha*, whose age is pretty well ascertained, is not mentioned in them; but, in the twelfth century before our era, the *Chinese* empire was at least in its cradle. This fact it is necessary to prove; and my first witness is *Confucius* himself. I know to what keen satire I shall expose myself by citing that philosopher, after the bitter sarcasms of M. *Pauw* against him and against the translators of his mutilated, but valuable works; yet I quote without scruple the book entitled *Lun Yu*, of which I possess the original with a verbal translation, and which I know to be sufficiently authentic for my present purpose. In the second part of it *Confu-tsu* declares, that "Altho' he, like other men, could relate, as mere lessons "of morality, the histories of the first and second imperial houses, yet, *for want of evidence*, he could "give no certain account of them." Now, if the *Chinese* themselves do not even pretend that any historical monument existed in the age of *Confucius*, preceding the rise of their third dynasty, about eleven hundred years before the *Christian* epoch, we may justly conclude that the reign of *Vuvam* was in the infancy of their empire, which hardly grew to maturity till some ages after that prince; and it has been asserted by very learned *Europeans*, that even of the third dynasty, which he has the fame of having raised, no unsuspected memorial can now be produced. It was not till the eighth century before the birth of our

Saviour, that a ſmall kingdom was erected in the province of *Shen-ſi*, the capital of which ſtood nearly in the *thirty fifth* degree of northern latitude; and about *five* degrees to the weſt of *Si-gan*; both the country and its metropolis were called *Chin*; and the dominion of its princes was gradually extended to the eaſt and weſt. A king of *Chin*, who makes a figure in the *Shahnamah* among the allies of *Afraſiyab*, was, I preſume, a ſovereign of the country juſt mentioned; and the river of *Chin*, which the poet frequently names as the limit of his eaſtern geography, ſeems to have been the *Yellow River*, which the *Chineſe* introduce at the beginning of their fabulous annals. I ſhould be tempted to expatiate on ſo curious a ſubject, but the preſent occaſion allows nothing ſuperfluous, and permits me only to add, that *Mangukhan* died in the middle of the thirteenth century, before the city of *Chin*, which was afterwards taken by *Kublai*, and that the poets of *Iran* perpetually allude to the diſtricts around it which they celebrate, with *Chegil* and *Khoten*, for a number of muſk-animals roving on their hills. The territory of *Chin*, ſo called by the old *Hindus*, by the *Perſians*, and by the *Chineſe* (while the *Greeks* and *Arabs* were obliged by their defective articulation to miſcall it *Sin*) gave its name to a race of emperors, whoſe tyranny made their memory ſo unpopular, that the modern inhabitants of *China* hold the word in abhorrence, and ſpeak of themſelves as the people of a milder and more virtuous dynaſty; but it is highly probable that the whole nation deſcended from the *Chinas* of *Menu*, and, mixing with the *Tartars* (by whom the plains of *Honan* and the more ſouthern provinces were thinly inhabited) formed by degrees the race of men whom we now ſee in poſſeſſion of the nobleſt empire in *Aſia*.

In ſupport of an opinion, which I offer as the reſult of long and anxious inquiries, I ſhould regularly

proceed to examine the language and letters, religion and philosophy of the present *Chinese*, and subjoin some remarks on their ancient monuments, on their sciences, and on their arts, both liberal and mechanical; but their spoken *language* not having been preserved in the usual symbols of articulate sounds, must have been for many ages in a continual flux; their *letters*, if we may so call them, are merely the symbols of ideas; their popular *religion* was imported from *India* in an age comparatively modern; and their *philosophy* seems yet in so rude a state as hardly to deserve the appellation; they have no *ancient monuments*, from which their origin can be traced even by plausible conjecture; their *sciences* are wholly exotic; and their *mechanical arts* have nothing in them characteristic of a particular family; nothing which any set of men, in a country so highly favoured by nature, might not have discovered and improved. They have indeed both national music and national poetry, and both of them beautifully pathetic; but of painting, sculpture, or architecture, as arts of imagination, they seem (like other *Asiatics*) to have no idea. Instead, therefore, of enlarging separately on each of those heads, I shall briefly inquire, how far the literature and religious practices of *China* confirm or oppose the proposition which I have advanced.

The declared and fixed opinion of M. *De Guignes*, on the subject before us, is nearly connected with that of the *Brahmans*: he maintains, that the *Chinese* were emigrants from *Egypt*; and the *Egyptians*, or *Ethiopians* (for they were clearly the same people) had indubitably a common origin with the old natives of *India*, as the affinity of their languages and of their institutions, both religious and political, fully evince; but that *China* was peopled a few centuries before our era by a colony from the banks of the *Nile*, tho' neither *Persians* nor *Arabs*, *Tartars* nor *Hindus*, ever heard of such an emigration, is a paradox, which the bare authority

even of so learned a man cannot support; and, since reason grounded on facts can alone decide such a question, we have a right to demand clearer evidence and stronger arguments than any that he has yet adduced. The hieroglyphics of *Egypt* bear, indeed, a strong resemblance to the mythological sculptures and paintings of *India*, but seem wholly dissimilar to the symbolical system of the *Chinese*, which might easily have been invented (as they assert) by an individual, and might very naturally have been contrived by the first *Chinas*, or outcast *Hindus*, who either never knew, or had forgotten, the alphabetical characters of their wiser ancestors. As to the table and bust of *Isis*, they seem to be given up as modern forgeries; but, if they were indisputably genuine, they would be nothing to the purpose; for the letters on the bust appear to havef been designed as alphabetical; and the fabricator o- them (if they really were fabricated in *Europe*) was uncommonly happy, since two or three of them are ex actly the same with those on a metal pillar yet standing in the north of *India*. In *Egypt*, if we can rely on the testimony of the *Greeks*, who studied no language but their own, there were two sets of alphabetical characters; the one *popular*, like the various letters used in our *Indian* provinces; and the other *sacerdotal*, like the *Devanagari*, especially that form of it which we see in the *Veda*; besides which they had two sorts of *sacred sculpture*; the one simple, like the figures of *Buddha* and the three *Ramas*; and the other allegorical, like the images of *Ganesa*, or *Divine Wisdom*, and *Isani*, or *Nature*, with all their emblematical accompanyments; but the *real character* of the *Chinese* appears wholly distinct from any *Egyptian* writing, either mysterious or popular: and, as to the fancy of M. *de Guignes*, that the complicated symbols of *China* were at first no more than *Phenician* monograms, let us hope that he has abandoned so wild a conceit, which he started probably with no other view than to display his ingenuity and learning.

We have ocular proof that the few radical characters of the *Chinese* were originally (like our aſtronomical and chymical ſymbols) the pictures or outlines of viſible objects, or figurative ſigns for ſimple ideas, which they have multiplied by the moſt ingenious combinations and the liveliest metaphors; but, as the ſyſtem is peculiar, I believe, to themſelves and the *Japaneſe*, it would be idly oſtentatious to enlarge on it at preſent; and, for the reaſons already intimated, it neither corroborates nor weakens the opinion which I endeavour to ſupport. The ſame may as truly be ſaid of their *ſpoken* language; for, independently of its conſtant fluctuation during a ſeries of ages, it has the peculiarity of excluding four or five ſounds which other nations articulate, and is clipped into monoſyllables, even when the ideas expreſſed by them, and the written ſymbols for thoſe ideas, are very complex. This has ariſen, I ſuppoſe, from the ſingular habits of the people; for, though their common tongue be ſo *muſically* accented as to form a kind of recitative, yet it wants thoſe *grammatical* accents, without which all human tongues would appear monoſyllabic. Thus *Amita*, with an accent on the firſt ſyllable, means, in the *Sanſcrit* language, *immeaſurable*; and the natives of *Bengal* pronounce it *Omito*; but when the religion of *Buddha*, the ſon of *Maya*, was carried hence into *China*, the people of that country, unable to pronounce the name of their new God, called him *Foe*, the ſon of *Mo-ye*, and divided his epithet *Amita* into three ſyllables *O-mi-to*, annexing to them certain ideas of their own, and expreſſing them in writing by three diſtinct ſymbols. We may judge from this inſtance, whether a compariſon of their ſpoken tongue with the dialects of other nations can lead to any certain concluſion as to their origin; yet the inſtance which I have given, ſupplies me with an argument from analogy, which I produce as conjectural only, but which appears more and more plauſible the oftener I

confider it. The *Buddha* of the *Hindus* is unqueftionably the *Foe* of *China*; but the great progenitor of the *Chinefe* is alfo named by them *Fo-hi*, where the fecond monofyllable fignifies, it feems, a *victim*. Now the anceftor of that military tribe, whom the *Hindus* call the *Chandravanfa*, or *Children of the Moon*, was, according to their *Puranas* or legends, *Buddha*, or the genius of the planet *Mercury*, from whom, in the *fifth* degree, defcended a prince named *Druhya*; whom his father *Yayati* fent in exile to the eaft of *Hinduftan*, with this imprecation, "May thy progeny be "ignorant of the *Veda*." The name of the banifhed prince could not be pronounced by the modern *Chinefe*; and, though I dare not conjecture that the laft fyllable of it has been changed into *Yao*, I may neverthelefs obferve that *Yao* was the *fifth* in defcent from *Fo-hi*, or at leaft the fifth mortal in the firft imperial dynafty; that all *Chinefe* hiftory before him is confidered by the *Chinefe* themfelves as poetical or fabulous; that his father *Ti-co*, like the *Indian* king *Yayati*, was the firft prince who married feveral women; and that *Fo-hi*, the head of their race, appeared, fay the *Chinefe*, in a province of the weft, and held his court in the territory of *Chin*, where the rovers, mentioned by the *Indian* legiflator, are fuppofed to have fettled. Another circumftance in the parallel is very remarkable:—According to Father *De Premare*, in his tract on *Chinefe* Mythology, the mother of *Fo-hi* was the *Daughter of Heaven*, furnamed *Flower-loving*; and as the nymph was walking alone on the bank of a *river* with a fimilar name, fhe found herfelf on a fudden encircled by a *rainbow*; foon after which fhe became pregnant, and at the end of twelve years was delivered of a fon radiant as herfelf, who, among other titles, had that of *Sui*, or *Star of the Year*. Now, in the mythological fyftem of the *Hindus*, the nymph *Rohini*, who prefides over the fourth lunar manfion, was the favourite miftrefs of *Soma*, or the Moon, among

whoſe numerous epithets we find *Cumudanayaca*, or *Delighting in a* ſpecies of *water-flower* that bloſſoms at night; and their offspring was *Buddha*, regent of a planet, and called alſo, from the names of his parents *Rauhineya*, or *Saumya*. It is true that the learned miſſionary explains the word *Sui* by *Jupiter*; but an exact reſemblance between two ſuch fables could not have been expected; and it is ſufficient for my purpoſe that they ſeem to have a family likeneſs. The God *Buddha*, ſay the *Indians*, married *Ila*, whoſe father was preſerved in a miraculous ark from an univerſal deluge. Now, although I cannot inſiſt with confidence that the *rainbow* in the *Chineſe* fable alludes to the *Moſaic* narrative of the flood, nor build any ſolid argument on the divine perſonage *Niu-va*, of whoſe character, and even of whoſe ſex, the hiſtorians of *China* ſpeak very doubtfully, I may nevertheleſs, aſſure you, after full inquiry and conſideration, that the *Chineſe*, like the *Hindus*, believe this earth to have been wholly covered with water, which, in works of undiſputed authenticity, they deſcribe as *flowing abundantly, then ſubſiding, and ſeparating the higher from the lower age of mankind*; that the *diviſion of time*, from which their poetical hiſtory begins, juſt preceded the appearance of *Fo-hi* on the mountains of *Chin*; but that the great *inundation* in the reign of *Yao* was either confined to the lowlands of his kingdom, if the whole account of it be not a fable, or, if it contain any alluſion to the flood of *Noah*, has been ignorantly miſplaced by the *Chineſe* annaliſts.

The importation of a new religion into *China* in the firſt century of our era, muſt lead us to ſuppoſe that the former ſyſtem, whatever it was, had been found inadequate to the purpoſe of reſtraining the great body of the people from thoſe offences againſt conſcience and virtue, which the civil power could not reach; and it is hardly poſſible that, without ſuch reſtrictions, any government could long have ſubſiſted with felicity; for no

government can long ſubſiſt without equal juſtice, and juſtice cannot be adminiſtered without the ſanctions of religion. Of the religious opinions entertained by *Confucius* and his followers, we may glean a general notion from the fragments of their works tranſlated by *Couplet*. They profeſſed a firm belief in the Supreme God, and gave a demonſtration of his being and of his providence from the exquiſite beauty and perfection of the celeſtial bodies, and the wonderful order of nature in the whole fabric of the viſible world. From this belief, they deduced a ſyſtem of ethics, which the philoſopher ſums up in a few words at the cloſe of the *Lun-yu*: "He," ſays *Confucius*, "who will be fully "perſuaded that the Lord of Heaven governs the "univerſe, who ſhall in all things chuſe moderation, "who ſhall perfectly know his own ſpecies, and ſo act "among them that his life and manners may con-"form to his knowledge of God and man, may be "truly ſaid to diſcharge all the duties of a ſage, and "to be far exalted above the common herd of the "human race." But ſuch a religion and ſuch morality could never have been general; and we find that the people of *China* had an ancient ſyſtem of ceremonies and ſuperſtitions, which the government and the philoſophers appear to have encouraged, and which has an apparent affinity with ſome parts of the oldeſt *Indian* worſhip. They believed in the agency of genii, or tutelary ſpirits, preſiding over the ſtars and the clouds, over lakes and rivers, mountains, valleys, and woods, over certain regions and towns, over all the elements (of which, like the *Hindus*, they reckoned *five*) and particularly over *fire*, the moſt brilliant of them. To thoſe deities they offered victims on high places: and the following paſſage from the *Shi-cin*, or *Book of Odes*, is very much in the ſtyle of the *Brahmans*:— "Even they, who perform a ſacrifice with a due reve-"rence, cannot perfectly aſſure themſelves that the di-"vine ſpirits accept their oblations; and far leſs can "they, who adore the Gods with languor and oſcitancy,

"clearly perceive their ſacred illapſes." Theſe are imperfect traces indeed, but they are traces of an affinity between the religion of *Menu* and that of the *Chinas*, whom he names among the apoſtates from it. M. *Le Gentil* obſerved, he ſays, a ſtrong reſemblance between the funeral rites of the *Chineſe* and the *Sraddha* of the *Hindus*; and M. *Bailly*, after a learned inveſtigation, concludes, that "Even the puerile and abſurd ſtories "of the *Chineſe* fabuliſts, contain a remnant of an- "cient *Indian* hiſtory, with a faint ſketch of the firſt "*Hindu* ages." As the *Buddhas*, indeed, were *Hindus*, it may naturally be imagined that they carried into *China* many ceremonies practiſed in their own country; but the *Buddhas* poſitively forbade the immolation of cattle; yet we know that various animals, even bulls and men, were anciently ſacrificed by the *Chineſe*; beſides which, we diſcover many ſingular marks of relation between them and the old *Hindus*: as in the remarkable period of *four hundred and thirty-two thouſand*, and the cycle of *ſixty* years; in the predilection for the myſtical number *nine*; in many ſimilar faſts and great feſtivals, eſpecially at the ſolſtices and equinoxes; in the juſt-mentioned obſequies conſiſting of rice and fruits offered to the manes of their anceſtors; in the dread of dying childleſs, leſt ſuch offerings ſhould be intermitted; and, perhaps, in their common abhorrence of red objects, which the *Indians* carried ſo far, that *Menu* himſelf, where he allows a *Brahmen* to trade, if he cannot otherwiſe ſupport life, abſolutely forbids "his trafficking in any ſort "of *red* cloths, whether linen or woollen, or made "of woven bark" All the circumſtances, which have been mentioned under the two heads of *Literature* and *Religion*, ſeem collectively to prove (as far as ſuch a queſtion admits proof) that the *Chineſe* and *Hindus* were originally the ſame people; but having been ſeparated near four thouſand years, have retained few ſtrong features of their ancient conſanguinity, eſpecially as the *Hindus* have preſerved their old language and

ritual, while the *Chinese* very ſoon loſt both; and the *Hindus* have conſtantly intermarried among themſelves, while the *Chineſe*, by a mixture of *Tartarian* blood from the time of their firſt eſtabliſhment, have at length formed a race diſtinct in appearance both from *Indians* and *Tartars*.

A ſimilar diverſity has ariſen, I believe, from ſimilar cauſes, between the people of *China* and *Japan*; on the ſecond of which nations we have now, or ſoon ſhall have, as correct and as ample inſtruction as can poſſibly be obtained without a perfect acquaintance with the *Chineſe* characters. *Kæmpfer* has taken from M. *Titſingh* the honour of being the firſt; and he from *Kæmpfer*, that of being the only *European* who, by a long reſidence in *Japan*, and a familiar intercourſe with the principal natives of it, has been able to collect authentic materials for the natural and civil hiſtory of a country *ſecluded* (as the *Romans* uſed to ſay of our own iſland) *from the reſt of the world*. The works of thoſe illuſtrious travellers will confirm and embelliſh each other; and when M. *Titſingh* ſhall have acquired a knowledge of *Chineſe*, to which a part of his leiſure in *Java* will be devoted, his precious collection of books in that language, on the laws and revolutions, the natural productions, the arts, manufactures, and ſciences of *Japan*, will be in his hands an inexhauſtible mine of new and important information. Both he and his predeceſſor aſſert with confidence, and, I doubt not, with truth, that the *Japaneſe* would reſent, as an inſult on their dignity, the bare ſuggeſtion of their deſcent from the *Chineſe*, whom they ſurpaſs in ſeveral of the mechanical arts, and, what is of greater conſequence, in military ſpirit; but they do not, I underſtand, mean to deny that they are a branch of the ſame ancient ſtem with the people of *China*; and, were that fact ever ſo warmly conteſted by them, it might be proved by an invinci-

ble argument, if the preceding part of this discourse, on the origin of the *Chinese*, be thought to contain just reasoning. In the first place, it seems inconceivable that the *Japanese*, who never appear to have been conquerors or conquered, should have adopted the whole system of *Chinese* literature with all its inconveniences and intricacies, if an immemorial connexion had not subsisted between the two nations, or, in other words, if the blood and ingenious race who peopled *Japan* in the middle of the thirteenth century before *Christ*, and, about six hundred years afterwards established their monarchy, had not carried with them the letters and learning which they and the *Chinese* had possessed in common; but my principal argument is, that the *Hindu* or *Egyptian* idolatry has prevailed in *Japan* from the earliest ages; and among the idols worshipped, according to *Kæmpfer*, in that country before the innovations of *Sacya* or *Buddha*, whom the *Japanese* also called *Amida*, we find many of those which we see every day in the temples of *Bengal*; particularly *the goddess with many arms*, representing the powers of nature; in *Egypt* named *Isis*, and here *Isani* or *Isi*; whose image, as it is exhibited by the *German* traveller, all the *Brahmans* to whom I showed it, immediately recognized with a mixture of pleasure and enthusiasm.— It is very true that the *Chinese* differ widely from the natives of *Japan* in their vernacular dialects, in external manners, and perhaps in the strength of their mental faculties; but as wide a difference is observable among all the nations of the *Gothic* family; and we might account even for a greater dissimilarity, by considering the number of ages during which the several swarms have been separated from the great *Indian* hive, to which they primarily belonged. The modern *Japanese* gave *Kæmpfer* the idea of polished *Tartars*; and it is reasonable to believe, that the people of *Japan*, who were originally *Hindus* of the mar-

tial claſs, and advanced farther caſtward than the *Chinas*, have, like them, inſenſibly changed their features and characters by intermarriages with various *Tartarian* tribes, whom they found looſely ſcattered over their iſles, or who afterwards fixed their abode in them.

Having now ſhown, in five diſcourſes, that the *Arabs* and *Tartars* were originally diſtinct races, while the *Hindus*, *Chineſe*, and *Japaneſe* proceeded from another ancient ſtem, and that all the three ſtems may be traced to *Iran*, as to a common centre, from which it is highly probable that they diverged in various directions about four thouſand years ago, I may ſeem to have accompliſhed my deſign of inveſtigating the origin of the *Aſiatic* nations; but the queſtions which I undertook to diſcuſs, are not yet ripe for a ſtrict analytical argument; and it will firſt be neceſſary to examine with ſcrupulous attention all the detached or inſulated races of men, who either inhabit the borders of *India*, *Arabia*, *Tartary*, *Perſia*, and *China*, or are interſperſed in the mountainous and uncultivated parts of thoſe extenſive regions. To this examination I ſhall, at our next annual meeting, allot an entire diſcourſe; and if, after all our inquiries, no more than *three* primitive races can be found, it will be a ſubſequent conſideration whether thoſe three ſtocks had one common root; and, if they had, by what means that root was preſerved amid the violent ſhocks which our whole globe appears evidently to have ſuſtained.

XXVI.

THE TRANSLATION OF AN INSCRIPTION IN THE MAGA LANGUAGE,

Engraved on a Silver Plate, found in a Cave near Islamabad.

COMMUNICATED BY JOHN SHORE, ESQ.

ON the 14th of *Magha* 904, *Chandi Lah Raja**, by the advice of *Bowangari Rauli*, who was the director of his studies and devotions, and in conformity to the sentiments of twenty-eight other *Raulis*, formed the design of establishing a place of religious worship; for which purpose a cave was dug, and paved with bricks, three cubits in depth, and three cubits also in diameter; in which were deposited one hundred and twenty brazen images of small dimensions, denominated *Tahmudas*; also, twenty brazen images larger than the former, denominated *Languda*; there was likewise a large image of stone, called *Langudagari*, with a vessel of brass, in which were deposited two of the bones of *T'hacur*. On a silver plate were inscribed the *Hauca*, or the mandates of the Deity; with that also styled *Taumah Chucksowna Tahma*, to the study of which twenty-eight *Raulis* devote their time and attention; who, having celebrated the present work of devotion with festivals and rejoicings, erected over the cave a place of religious worship for the *Magas*, in honour of the deity.

God sent into the world *Buddha Avatar* to instruct and direct the steps of angels and of men; of whose birth and origin the following is a relation:—When *Buddha Avatar* descended from the region of souls, in

* Perhaps *Sandilyah*.

the month of *Magh*, and entered the body of *Mahamaya*, the wife of *Sootah Dannah*, *Raja* of *Cailas*, her womb ſuddenly aſſumed the appearance of clear tranſparent cryſtal, in which *Buddha* appeared, beautiful as a flower, kneeling and reclining on his hands. After ten months and ten days of her pregnancy had elapſed, *Mahamaya* ſolicited permiſſion from her huſband, the *Raja*, to viſit her father: in conformity to which the roads were directd to be repaired and made clear for her journey; fruit-trees were planted, water-veſſels placed on the road-ſide, and great illuminations prepared for the occaſion. *Mahamaya* then commenced her journey, and arrived at a garden adjoining to the road, where inclination led her to walk and gather flowers. At this time, being ſuddenly attacked with the pains of child-birth, ſhe laid hold on the trees for ſupport, which declined their boughs at the inſtant, for the purpoſe of concealing her perſon, while ſhe was delivered of the child; at which juncture *Brahma* himſelf attended with a golden veſſel in his hand, on which he laid the child, and delivered it to *Indra*, by whom it was committed to the charge of a female attendant; upon which the child, alighting from her arms, walked ſeven paces, whence it was taken up by *Mahamaya* and carried to her houſe, and, on the enſuing morning, news were circulated of a child being born in the *Raja*'s family. At this time *Tapaſwi Muni*, who, reſiding in the woods, devoted his time to the worſhip of the deity, learned by inſpiration that *Buddha* was come to life in the *Raja*'s palace: he flew through the air to the *Raja*'s reſidence, where, ſitting on a throne, he ſaid, "I have repaired "hither for the purpoſe of viſiting the child." *Buddha* was accordingly brought into his preſence. The *Muni* obſerved two feet fixed on his head, and, divining ſomething both of good and bad import, began to weep and laugh alternately. The *Raja* then queſtioned him with regard to his preſent impulſe, to whom he anſwered, "I muſt not reſide in the ſame place

" with *Buddha* when he ſhall arrive at the rank of
" *Avatar*; this is the cauſe of my preſent affliction;
" but I am even now affected with gladneſs by his
" preſence, as I am hereby abſolved from all my
" tranſgreſſions" The *Muni* then departed; and, after five days had elapſed, he aſſembled four *Pandits* for the purpoſe of calculating the deſtiny of the child; three of whom divined, that, as he had marks on his hands reſembling a wheel, he would at length become a *Raja Chacraverti*: another divined, that he would arrive at the dignity of *Avatar*.

The boy was now named *Sacya*, and had attained the age of ſixteen years; at which period it happened that the *Raja Chuhidan* had a daughter named *Yaſutara*, whom he had engaged not to give in marriage to any one, till ſuch time as a ſuitor ſhould be found who could brace a certain bow in his poſſeſſion, which hitherto many *Rajas* had attempted to accompliſh without effect. *Sacya* now ſucceeded in the attempt, and accordingly obtained the *Raja*'s daughter in marriage, with whom he repaired to his own place of reſidence.

One day, as certain myſteries were revealed to him, he formed the deſign of relinquiſhing his dominion; at which time a ſon was born in his houſe, whoſe name was *Raghu*. *Sacya* then left his palace with only one attendant and a horſe, and, having croſſed the river *Ganga*, arrived at *Balucah*, where, having directed his ſervant to leave him and carry away his horſe, he laid aſide his armour.

When the world was created, there appeared five flowers, which *Brahma* depoſited in a place of ſafety; three of them were afterwards delivered to the three *T'hacurs*, and one was preſented to *Sacya*, who

diſcovered, that it contained ſome pieces of wearing-apparel, in which he clothed himſelf, and adopted the manners and life of a mendicant. A traveller one day paſſed by him with eight bundles of graſs on his ſhoulders, and addreſſed him, ſaying, "A "long period of time has elapſed ſince I have ſeen "the *T'hacur*; but now ſince I have the happineſs "to meet him, I beg to preſent him an offering, con-"ſiſting of theſe bundles of graſs." *Sacya* accordingly accepted of the graſs, and repoſed on it. At that time there ſuddenly appeared a golden temple, containing a chair of wrought gold; and the height of the temple was thirty cubits, upon which *Brahma* alighted, and held a canopy over the head of *Sacya*: at the ſame time *Indra* deſcended, with a large fan in his hand, and *Naga*, the *Raja* of ſerpents, with ſhoes in his hand, together with the four tutelar deities of the four corners of the univerſe; who all attended to do him ſervice and reverence. At this time likewiſe the chief of *Aſurs* with his forces arrived, riding on an elephant, to give battle to *Sacya*; upon which *Brahma*, *Indra*, and the other deities deſerted him and vaniſhed. *Sacya*, obſerving that he was left alone, invoked the aſſiſtance of the earth; who, attending at his ſummons, brought an inundation over all the ground, whereby the *Aſur* and his forces were vanquiſhed, and compelled to retire.

At this time five holy ſcriptures deſcended from above, and *Sacya* was dignified with the title of *Buddha Avatar*. The ſcriptures confer powers of knowledge and retroſpection, the ability of accompliſhing the impulſes of the heart, and of carrying into effect the words of the mouth. *Sacya* reſided here, without breaking his faſt, twenty-one days, and then returned to his own country, where he preſides over *Rajas*, governing them with care and equity.

Whoever reads the *Caric*, his body, apparel, and the place of his devotions muſt be purified; he ſhall be thereby delivered from the evil machinations of demons and of his enemies; and the ways of redemption ſhall be open to him. *Buddha Avatar* inſtructed a certain *Rauli*, by name *Anguli Mala*, in the writings of the *Caric*, ſaying, "whoever ſhall read and ſtudy them, his ſoul ſhall not undergo a tranſmigration:" and the ſcriptures were thence called *Anguli Mala*. There were likewiſe five other books of the *Caric*, denominated *Vachanam*, which if any one peruſe, he ſhall therefore be exempted from poverty and the machinations of his enemies; he ſhall alſo be exalted to dignity and honours, and the length of his days ſhall be protracted. The ſtudy of the *Caric* heals afflictions and pains of the body; and whoever ſhall have faith therein, Heaven and bliſs ſhall be the reward of his piety.

XXVII.

A SUPPLEMENT TO THE ESSAY ON INDIAN CHRONOLOGY.

BY THE PRESIDENT.

OUR ingenious aſſociate Mr. *Samuel Davis* (whom I name with reſpect and applauſe, and who will ſoon, I truſt, convince M. *Bailly* that it is very poſſible for an *European* to tranſlate and explain the *Surya Siddhanta*) favoured me lately with a copy, taken by his *Pandit*, of the original paſſage, mentioned in his paper on the Aſtronomical Computations of the *Hindus* concerning the places of the colures in the time of *Varaha*, compared with their poſition in the age of a certain *Muni*, or ancient *Indian* philoſopher; and the paſſage appears to afford evidence of two actual obſervations, which will aſcertain the chronology of the *Hindus*, if not by rigorous demonſtration, at leaſt by a near approach to it.

The copy of the *Varahiſanhita*, from which the three pages received by me had been tranſcribed, is unhappily ſo incorrect (if the tranſcript itſelf was not haſtily made) that every line of it muſt be disfigured by ſome groſs error; and my *Pandit*, who examined the paſſage carefully at his own houſe, gave it up as inexplicable; ſo that, if I had not ſtudied the ſyſtem of *Sanſcrit* proſody, I ſhould have laid it aſide in deſpair: but though it was written as proſe, without any ſort of diſtinction or punctuation, yet, when I read it aloud, my ear caught, in ſome ſentences, the cadence of verſe, and of a particular metre, called *Arya*, which is regulated (not by the *number* of ſyllables, like other *Indian* meaſures, but) by the proportion of

times, or *ſyllabic moments*, in the four diviſions of which every ſtanza conſiſts. By numbering thoſe moments and fixing their proportion, I was enabled to reſtore the text of *Varaha*, with the perfect aſſent of the learned *Brahmen* who attends me; and, with his aſſiſtance, I alſo corrected the comment, written by *Bhattotpala*, who, it ſeems, was a ſon of the author, together with three curious paſſages, which are cited in it. Another *Pandit* afterwards brought me a copy of the whole original work, which confirmed my conjectural emendations, except in two immaterial ſyllables, and except that the firſt of the ſix couplets in the text is quoted in the commentary from a different work, entitled *Panchaſiddhantica*, five of them were compoſed by *Varaha* himſelf; and the third chapter of his treatiſe begins with them.

Before I produce the original verſes, it may be uſeful to give you an idea of the *Arya* meaſure; which will appear more diſtinctly in *Latin* than in any modern language of *Europe*:

Tigridas, apros, thoas, tyrannos, peſſima monſtra, venemur:
Dic hinnulus, dic lepus male quid egerint graminivori.

The couplet might be ſo arranged as to begin and end with the cadence of an hexameter and pentameter, ſix *moments* being interpoſed in the middle of the long, and ſeven in that of the ſhort hemiſtich:

Thoas, apros, tigridas nos *venemur*, pejoreſque tyrannos:
Dic tibi cerva, lepus *tibi dic male quid* egerit herbivorus.

Since the *Arya* meaſure, however, may be almoſt infinitely varied, the couplet would have a form completely *Roman*, if the proportion of *ſyllabic inſtants*,

in the long and ſhort verſes, were *twenty-four* to *twenty*, inſtead of *thirty* to *twenty-ſeven*:

Venor apros tigridaſque, et, peſſima monſtra, tyrannos:
Cerva mali quid agunt herbivoruſque lepus?

I now exhibit the five ſtanzas of *Varaha* in European characters, with an etching of the two firſt, which are the moſt important, in the original *Devanagari*:

Aſleſhardhaddacſhinamuttaramayananraverdhaniſht'hadyan
Nunan cadachidaſidyenoctan purva ſaſtreſhu.
Sampratam ayanan ſavituh carcatacadyan mrigaditaſchanyat:
Uctabhave vicritih pratyacſhapericſhanair vyactih.
Duraſt'hachihnavedy adudaye'ſtamaye'piva ſahaſranſoh,
Ch'hayapraveſanirgamachihnairva mandale mahati.
Aprapya macaramarco vinivritto hanti ſeparan yamyan,
Carcatacamaſanprapto vinivrittaſchottaran ſaindrin.
Uttaramayanamatitya vyavrittah cſhemaſaſya vriddhicarah,
Pracritiſt'haſchapyevan vicritigatir bhayacriduſhnanſuh.

Of the five couplets thus exhibited, the following tranſlation is moſt ſcrupulouſly literal:

" Certainly the ſouthern ſolſtice was once in the
" middle of *Aſleſha*; the northern in the firſt *degree* of
" *Dhaniſht'ha*, by what *is* recorded in former *Saſtras*.
" At preſent, one ſolſtice is in the *degree* of *Carcata*, and the other in the firſt of *Macara*. That
" which *is* recorded not appearing, a change *muſt*

" *have happened*; *and* the proof ariſes from ocular
" demonſtrations; *that is*, by obſerving the remote
" object and its marks at the riſing or ſetting of the
" ſun, or by the marks in a large *graduated* circle,
" of the ſhadow's ingreſs and egreſs. The ſun, by
" turning back without having reached *Macara*, de-
" ſtroys the ſouth and the weſt; by turning back
" without having reached *Carcata*, the north and
" eaſt. By returning when he has juſt paſſed the
" winter ſolſtitial point, he makes wealth ſecure and
" grain abundant, ſince he moves thus according to
" nature; but the ſun, by moving unnaturally, ex-
" cites terror."

Now the *Hindu* aſtronomers agree, that the 1ſt of *January* 1790, was in the year 4891 of the *Caliyuga*, or their *fourth* period; at the beginning of which, they ſay, the equinoctial points were in the firſt degrees of *Meſha* and *Tula*; but they are alſo of opinion, that the vernal equinox oſcillates from the third of *Mina* to the twenty-ſeventh of *Meſha*, and back again in 7200 years, which they divide into four *padas*, and conſequently that it moves in the two intermediate *padas* from the firſt to the twenty-ſeventh of *Meſha* and back again in 3600 years; the colure cutting their ecliptic in the firſt of *Meſha*, which coincides with the firſt of *Aſwin*, at the beginning of every ſuch oſcillatory period. *Varaha*, ſurnamed *Mihira*, or the Sun, from his knowledge of aſtronomy, and uſually diſtinguiſhed by the title of *Acharya*, or teacher of the *Veda*, lived, confeſſedly, when the *Caliyuga* was far advanced; and, ſince by actual obſervation he found the ſolſtitial points in the firſt degrees of *Carcata* and *Macara*, the equinoctial points were at the ſame time in the firſt of *Meſha* and *Tula*; he lived, therefore, in the year 3600 of the fourth *Indian* period, or 1291 years before the 1ſt of *January* 1790, that is, about the year 499 of our era. This date correſponds with the

ayananſa, or preceſſion, calculated by the rule of the *Surya Siddhanta*; for 19° 21′ 54″ would be the preceſſion of the equinox in 1291 years, according to the *Hindu* computation of 54″ annually, which gives us the original of the *Indian* Zodiac nearly; but, by *Newton*'s demonſtrations, which agree as well with the phenomena as the varying denſity of our earth will admit, the equinox recedes about 50″ every year, and has receded 17° 55′ 50″ ſince the time of *Varaha*; which gives us more nearly in our own ſphere the firſt degree of *Meſha* in that of the *Hindus*. By the obſervation recorded in older *Saſtras*, the equinox had gone back 23° 20′; or about 1680 years had intervened between the age of the *Muni* and that of the modern aſtronomer: the former obſervation, therefore, muſt have been made about 2971 years before the 1ſt of *January* 1790; that is, 1181 before *Chriſt*.

We come now to the Commentary, which contains information of the greateſt importance. By former *Saſtras* are meant, ſays *Bhattotpala*, the books of *Paraſara* and of other *Munis*; and he then cites from the *Paraſari Sinhita* the following paſſage, which is in modulated proſe, and in a ſtyle much reſembling that of the *Vedas*:

Sraviſhtadyat pauſhnardhantan charah ſiſiro; vaſantah pauſhnardhat rohinyantan; ſaumyadyadaſleſhardhantan griſhmah; pravri daſleſhardhat haſtantan; chitradyat jyeſht'hardhantan ſarat; hemanto jyeſht'hardhat vaiſhnavantan.

" The ſeaſon of *Siſira* is from the firſt of *Dha-*
" *niſht'ha* to the middle of *Revati*; that of *Vaſanta*
" from the middle of *Revati* to the end of *Rohini*;
" that of *Griſhma* from the beginning of *Mrigaſiras*
" to the middle of *Aſleſha*; that of *Verſha* from
" the middle of *Aſleſha* to the end of *Haſta*; that

" of *Sarad* from the first of *Chitra* to the middle of
" *Jyesht'ha*; that of *Hemanta* from the middle of
" *Jyesht'ha* to the end of *Sravana*."

This account of the six *Indian* seasons, each of which is co-extensive with two signs, or four lunar stations and a half, places the solstitial points, as *Varaha* has asserted, in the first degree of *Dhanisht'ha*, and the middle, or 6° 40′, of *Aslesha*, while the equinoctial points were in the *tenth* degree of *Bharani* and 3° 20′ of *Visac'ha*; but, in the time of *Varaha*, the solstitial colure passed through the tenth degree of *Punarvasu* and 3° 20′ of *Uttarashara*, while the equinoctial colure cut the *Hindu* ecliptic in the first of *Aswini* and 6° 40′ of *Chitra*, or the *Yoga* and only star of that mansion, which, by the way, is indubitably the *Spike* of the Virgin, from the known longitude of which all other points in the *Indian* Zodiac may be computed. It cannot escape notice, that *Parasara* does not use in this passage the phrase *at present*, which occurs in the text of *Varaha*; so that the places of the colures might have been ascertained *before* his time, and a considerable change might have happened in their true position without any change in the phrases by which the seasons were distinguished, as our popular language in astronomy remains unaltered, though the Zodiacal asterisms are now removed a whole sign from the places where they have left their names. It is manifest, nevertheless, that *Parasara* must have written *within twelve centuries* before the beginning of our era; and that single fact, as we shall presently show, leads to very momentous consequences in regard to the system of *Indian* history and literature.

On the comparison which might easily be made between the colures of *Parasara* and those acribed by

Eudoxus to *Chiron*, the ſuppoſed aſſiſtant and inſtructor of the *Argonauts*, I ſhall ſay very little; becauſe the whole *Argonautic* ſtory (which neither was, according to *Herodotus*, nor, indeed, could have been originally *Grecian*) appears, even when ſtripped of its poetical and fabulous ornaments, extremely diſputable; and whether it was founded on a league of the *Helladian* princes and ſtates for the purpoſe of checking, on a favourable opportunity, the overgrown power of *Egypt*, or with a view to ſecure the commerce of the *Euxine* and appropriate the wealth of *Colchis*; or, as I am diſpoſed to believe, on an emigration from *Africa* and *Aſia* of that adventurous race, who had firſt been eſtabliſhed in *Chaldea*; whatever, in ſhort gave riſe to the fable, which the old poets have ſo richly embelliſhed, and the old hiſtorians have ſo inconſiderably adopted, it ſeems to me very clear, even on the principles of *Newton*, and on the ſame authorities to which he refers, that the voyage of the *Argonauts* muſt have preceded the year in which his calculations led him to place it. *Battus* built *Cyrene*, ſays our great philoſopher, on the ſcite of *Iraſa*, the city of *Antæus*, in the year 633 before *Chriſt*; yet he ſoon afterwards calls *Euripylus*, with whom the *Argonauts* had a conference, king of *Cyrene*; and in both paſſages he cites *Pindar*, whom I acknowledge to have been the moſt learned, as well as the ſublimeſt of poets. Now, if I underſtand *Pindar* (which I will not aſſert, and I neither poſſeſs nor remember at preſent the *Scholia*, which I formerly peruſed) the fourth *Pythian* Ode begins with a ſhort panegyric on *Arceſilas* of *Cyrene*; "where," ſays the bard, "the prieſteſs, who ſat near the golden "eagles of *Jove*, propheſied of old, when *Apollo* was "not abſent from his manſion, that *Battus*, the colo-"nizer of fruitful *Lybia*, having juſt left the ſacred "iſle (*Thera*) ſhould build a city excelling in cars, "on the ſplendid breaſt of earth, and, *with the ſe-"venteenth generation*, ſhould refer to himſelf the "*Therean* prediction of *Medea* which that princeſs of "the *Colchians*, that impetuous daughter of *Æetes*,

" breathed from her immortal mouth, and thus deli-
" vered to the half-divine mariners of the warrior
" *Jaſon.*" From this introduction to the nobleſt and
moſt animated of the *Argonautic* poems, it appears
that *fifteen complete generations* had intervened between
the voyage of *Jaſon* and the emigration of *Battus*;
ſo that, conſidering *three* generations as equal to *an
hundred*, or *an hundred and twenty* years, which *New-
ton* admits to be the *Grecian* mode of computing
them, we muſt alſo place that voyage at leaſt *five* or *ſix
hundred years* before the time fixed by *Newton* him-
ſelf, according to his own computation, for the build-
ing of *Cyrene*; that is, *eleven* or *twelve hundred and
thirty-three* years before *Chriſt*: an age very near on
a medium to that of *Paraſara*. If the poet means af-
terwards to ſay, as I underſtand him, that *Arceſilas*,
his contemporary, was the *eighth* in deſcent from *Bat-
tus*, we ſhall nearly draw the ſame concluſion, without
having recourſe to the unnatural reckoning of *thirty-
three* or *forty* years to a generation; for *Pindar* was
forty years old when the *Perſians*, having croſſed the
Helleſpont, were nobly reſiſted at *Thermopylæ*, and
glorioufly defeated at *Salamis*. He was born, there-
fore, about the ſixty-fifth *Olympiad*, or five hundred
and twenty years before our era; ſo that, by allowing
more naturally *ſix* or *ſeven hundred* years to *twenty-
three* generations, we may at a medium place the
voyage of *Jaſon* about one thouſand one hundred and
ſeventy years before our Saviour, or about *forty-five*
years before the beginning of the *Newtonian* chro-
nology.

The deſcription of the old colures by *Eudoxus*, if
we implicitly rely on his teſtimony and on that of *Hip-
parchus*, who was, indiſputably, a great aſtronomer
for the age in which he lived, affords, I allow, ſuffici-
ent evidence of ſome rude obſervation about 937
years before the *Chriſtian* epoch; and, if the car-
dinal points had receded from thoſe colures 36° 29′

10″ at the beginning of the year 1690, and 37° 52′ 30″ on the first of *January* in the present year, they must have gone back 3° 23′ 20″ between the observation implied by *Parasara* and that recorded by *Eudoxus*; or, in other words, 224 years must have elapsed between the two observations. But this disquisition having little relation to our principal subject, I proceed to the last couplets of our *Indian* astronomer *Varaha Mihira*, which, although merely astrological, and consequently absurd, will give occasion to remarks of no small importance. They imply, that when the solstices are not in the first degrees of *Carcata* and *Macara*, the motion of the sun is contrary to nature; and being caused, as the commentator intimates, by some *utpata*, or preternatural agency, must necessarily be productive of misfortune; and this vain idea seems to indicate a very superficial knowledge even of the system which *Vahara* undertook to explain; but he might have adopted it solely as a religious tenet, on the authority of *Garga*, a priest of eminent sanctity, who expresses the same wild notion in the following couplet:

Yada nivertate'praptah sravishtamuttarayane,
Asleshan dacshine'praptastadavidyanmahadbhayam.

"When *the sun* returns, not having reached *Dhanisht'ha* in the northern solstice, *or* not having "reached *Aslesha* in the southern, then let *a man* "feel great apprehension of danger."

Parasara himself entertained a similar opinion, that any irregularity in the solstices would indicate approaching calamity: *Yadaprapto vaishnavantum*, says he, *udanmarge prepadyate dacshine asl esham va mahabhayaya*; that is, "When, having reached the "end of *Sravana*, in the northern path, or half of "*Aslesha* in the southern, he still advances, *it is* a "cause of great fear." This notion, possibly, had

its rise before the regular precession of the cardinal points had been observed; but we may also remark, that some of the lunar mansions were considered as inauspicious, and others as fortunate; thus *Menu*, the first *Indian* lawgiver, ordains, that certain rites shall be performed under the influence of a happy *Nacshatra*; and, where he forbids any female name to be taken from a constellation, the most learned commentator gives *Ardra* and *Revati* as examples of ill-omened names, appearing by design to skip over others that must first have occurred to him. Whether *Dhanisht'ha* and *Aslesha* were inauspicious or prosperous, I have not learned; but, whatever might be the ground of *Varaha*'s astrological rule, we may collect from his astronomy, which was grounded on observation, that the solstice had receded *at least* 23° 20′ between his time and that of *Parasara*; for, though it refers its position to the *signs*, instead of the *lunar mansions*, yet all the *Pandits* with whom I have conversed on the subject, unanimously assert, that the first degrees of *Mesha* and *Aswini* are coincident. Since the two ancient sages name only the lunar asterisms, it is probable that the solar division of the Zodiac into twelve signs was not generally used in their days; and we know from the comment on the *Surya Siddhanta*, that the lunar month, by which all religious ceremonies are still regulated, was in use before the solar. When M. *Bailly* asks " Why the " *Hindus* established the beginning of the precession, " according to their ideas of it, in the year of *Christ* " 429?" to which his calculations also had led him, we answer, Because *in that year* the vernal equinox was found by observation in the origin of their ecliptic; and since they were of opinion that it must have had the same position in the first year of the *Caliyuga*, they were induced by their erroneous theory to fix the beginning of their fourth period 3600 years before the time of *Varaha*, and to account for *Parasara*'s observation, by supposing an *utpata*, or *prodigy*.

To what purpoſe, it may be aſked, have we aſcertained the age of *Munis?* Who was *Paraſara?* Who was *Garga?* With whom were they contemporary, or with whoſe age may theirs be compared? What light will theſe inquiries throw on the hiſtory of *India* or of mankind? I am happy in being able to anſwer thoſe queſtions with confidence and preciſion.

All the *Brahmens* agree, that only one *Paraſara* is named in their ſacred records; that he compoſed the aſtronomical book before cited, and a law-tract, which is now in my poſſeſſion; that he was the grandſon of *Vaſiſht'ha*, another aſtronomer and legiſlator, whoſe works are ſtill extant, and who was the preceptor of *Rama*, king of *Ayodhya*; that he was the father of *Vyaſa*, by whom the *Vedas* were arranged in the form which they now bear, and whom *Criſhna* himſelf names with exalted praiſe in the *Gita*; ſo that, by the admiſſion of the *Pundits* themſelves, we find only three generations between two of the *Ramas*, whom they conſider as incarnate *portions* of the divinity; and *Paraſara* might have lived till the beginning of the *Caliyuga*, which the miſtaken doctrine of an oſcillation in the cardinal points has compelled the *Hindus* to place 1920 years too early. This error, added to their fanciful arrangement of the four ages, has been the ſource of many abſurdities; for they inſiſt that *Valmic*, whom they cannot but allow to have been contemporary with *Ramachandra*, lived in the age of *Vyaſa*, who conſulted him on the compoſition of the *Mahabharat*, and who was perſonally known to *Balarama*, the brother of *Criſhna*. When a very learned *Brahmen* had repeated to me an agreeable ſtory of a converſation between *Valmic* and *Vyaſa*, I expreſſed my ſurprize at an interview between two bards, whoſe ages were ſeparated by a period of 864,000 years; but he ſoon reconciled himſelf to ſo monſtrous an anachroniſm, by obſerving that the longevity of the

Munis was preternatural, and that no limit could be set to Divine power. By the ſame recourſe to miracles or to propheſy, he would have anſwered another objection equally fatal to his chronological ſyſtem. It is agreed by all, that the lawyer *Yagyawalcya* was an attendant on the court of *Janaca*, whoſe daughter *Sita* was the conſtant but unfortunate wife of the great *Rama*, the hero of *Valmic*'s poem; but that lawyer himſelf, at the very opening of his work, which now lies before me, names both *Paraſara* and *Vyaſa* among twenty authors, whoſe tracts form the body of original *Indian* law. By the way, ſince *Vaſiſht'ha* is more than once named in the *Manaviſanhita*, we may be certain that the laws aſcribed to *Menu*, in whatever age they might have been firſt promulgated, could not have received the form in which we now ſee them, above *three thouſand* years ago. The age and functions of *Garga* lead to conſequences yet more intereſting: he was confeſſedly the *purohita*, or officiating prieſt, of *Criſhna* himſelf, who, when only a herdſman's boy at *Mat'hura*, revealed his divine character to *Garga*, by running to him with more than mortal benignity on his countenance, when the prieſt had invoked *Narayan*. His daughter was eminent for her piety and her learning, and the *Brahmens* admit, without conſidering the conſequence of their admiſſion, that ſhe is thus addreſſed in the *Veda* itſelf: *Yata urdhwan no va ſamopi, Gargi, eſha adityo dyamurdhanan tapati, dya va bhumin tapati, bhumya ſubhran tapati, locan tapati, antaran tapatyanantaran tapati*; or, "That Sun, O daughter of "*Garga*, than which nothing is higher, to which no-"thing is equal, enlightens the ſummit of the ſky; "with the ſky enlightens the earth; with the earth "enlightens the lower worlds; enlightens the higher "worlds, enlightens other worlds; it enlightens the "breaſt, enlightens all beſides the breaſt."—From theſe facts, which the *Brahmens* cannot deny, and from

these conceſſions, which they unanimouſly make, we may reaſonably infer that, if *Vyaſa* was not the compoſer of the *Vedas*, he added at leaſt ſomething of his own to the ſcattered fragments of a more ancient work, or perhaps to the looſe traditions which he had collected; but whatever be the comparative antiquity of the *Hindu* ſcriptures, we may ſafely conclude that the *Moſaic* and *Indian* chronologies are perfectly conſiſtent; that *Menu*, ſon of *Brahma* was the *Adima*, or *firſt* created mortal, and conſequently our *Adam*; that *Menu*, child of the Sun, was preſerved with *ſeven* others in a *bahitra*, or capacious ark, from an univerſal deluge, and muſt therefore be our *Noah*; that *Hiranyacaſipu*, the giant *with a golden axe*, and *Vali*, or *Bali*, were impious and arrogant monarchs, and moſt probably our *Nimrod* and *Belus*; that the three *Ramas*, two of whom were invincible warriors, and the third not only valiant in war but the patron of agriculture and *wine*, which derives an epithet from his name, were different repreſentations of the *Grecian Bacchus*, and either the *Rama* of ſcripture, or his colony perſonified, or the Sun firſt adored by his idolatrous family; that a conſiderable emigration from *Chaldea* into *Greece*, *Italy*, and *India*, happened about *twelve* centuries before the birth of our Saviour; that *Sacya*, or *Siſak*, about two hundred years after *Vyaſa*, either in perſon or by a colony from *Egypt*, imported into this country the mild hereſy of the ancient *Bauddhas*; and that the dawn of true *Indian* hiſtory appears only three or four centuries before the *Chriſtian* era, the preceding ages being clouded by allegory or fable.

As a ſpecimen of that fabling and allegorizing ſpirit which has ever induced the *Brahmens* to diſguiſe their whole ſyſtem of hiſtory, philoſophy, and religion, I produce a paſſage from the *Bhagavat*, which, however ſtrange and ridiculous, is very curious in itſelf, and cloſely connected with the ſubject of this eſſay.

It is taken from the fifth *Scandha*, or ſection, which is written in modulated proſe. "There are ſome," ſays the *Indian* author, "who, for the purpoſe of me-" ditating intenſely on the holy ſon of *Vaſudeva*, ima-" gine yon celeſtial ſphere to repreſent the figure of" that aquatic animal which we call *Siſumara*: its head" being turned downwards, and its body bent in a" circle, they conceive *Dhruva*, or the pole-ſtar, to" be fixed on the point of its tail; on the middle" part of the tail they ſee four ſtars, *Prejapati*, *Agni*," *Indra*, *Dherma*, and on its baſe two others, *Dhatri*" and *Vidhatri*: on its rump are the *Septarſhis*, or" ſeven ſtars of the *Sacata*, or *Wain*; on its back" the path of the Sun, called *Ajavit'hi*, or the *Series*" *of Kids*; on its belly the *Ganga* of the ſky: *Punar-*" *vaſu* and *Puſhya* gleam reſpectively on its right and" left haunches; *Ardra* and *Aſleſha* on its right and left" feet, *or fins*; *Abhijit* and *Uttaraſhad'ha* in its right" and left noſtrils; *Sravana* and *Purvaſhad'ha* in its" right and left eyes; *Dhaniſht'ha* and *Mula* on its" right and left ears. Eight conſtellations, belonging" to the ſummer ſolſtice, *Magha*, *Purvap'halguni*," *Uttarap'halguni*, *Haſta*, *Chitra*, *Swati*, *Viſac'ha*," *Anuradha*, may be conceived in the ribs of its left" ſide; and as many aſteriſms, connected with the win-" ter ſolſtice, *Mrigaſiras*, *Rohini*, *Crittica*, *Bharani*, *Aſ-*" *wini*, *Revati*, *Uttarabhadrapada*, *Purvabhadrapada*," may be imagined on the ribs of its right ſide in an" inverſe order. Let *Satabhiſha* and *Jyeſht'ha* be placed" on its right and left ſhoulders. In its upper jaw is" *Agaſtya*; in its lower *Yama*; in its mouth the pla-" net *Mangala*; in its part of generation, *Sanaiſ-*" *chara*; on its hump, *Vrihaſpati*; in its breaſt, the" Sun; in its heart, *Narayan*; in its front, the Moon;" in its navel, *Uſanas*; on its two nipples, the two *Aſ-*" *winas*; in its aſcending and deſcending breaths," *Budha*; on its throat, *Rahu*; in all its limbs, *Cetus*," or comets; and in its hair, or briſtles, the whole

"multitude of ſtars." It is neceſſary to remark, that, although the *ſiſumara* be generally deſcribed as the *ſea-hog* or *porpoiſe*, which we frequently have ſeen playing in the *Ganges*, yet *ſuſmar*, which ſeems derived from the *Sanſcrit*, means in *Perſian* a large *lizard*. The paſſage juſt exhibited may nevertheleſs relate to an animal of the cetaceous order, and poſſibly to the dolphin of the antients. Before I leave the ſphere of the *Hindus*, I cannot help mentioning a ſingular fact :—In the *Sanſcrit* language, *Ricſha* means a *conſtellation* and a *bear*, ſo that *Maharcſha* may denote either a *great bear* or a *great aſteriſm*. Etymologiſts may, perhaps, derive the *Megas arctos* of the *Greeks* from an *Indian* compound ill underſtood; but I will only obſerve, with the wild *American*, that a bear *with a very long tail* could never have occurred to the imagination of any one who had ſeen the animal. I may be permitted to add, on the ſubject of the *Indian* Zodiac, that, if I have erred in a former eſſay, where the longitude of the lunar manſions is computed from the firſt ſtar in our conſtellation of the Ram, I have been led into an error by the very learned and ingenious M. *Bailly*, who relied, I preſume, on the authority of M. *Le Gentil*. The origin of the *Hindu* Zodiac, according to the *Surya Siddhanta*, muſt be nearly ♈ 19° 21′ 54″, in our ſphere, and the longitude of *Chitra*, or the Spike, muſt of courſe be 199° 21′ 54″ from the vernal equinox; but ſince it is difficult by that computation to arrange the twenty-ſeven manſions and their ſeveral ſtars, as they are delineated and enumerated in the *Retnamala*, I muſt for the preſent ſuppoſe with M. *Bailly*, that the *Zodiac* of the *Hindus* had two origins, one conſtant and the other variable; and a farther inquiry into the ſubject muſt be reſerved for a ſeaſon of retirement and leiſure.

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JATAMANSI,

or Indian Spikenard.

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आश्लेषार्द्धाद्दक्षिणमुत्तरमयनं रवेर्धनिष्ठाद्यं
नूनं कदाचिदासीद्येनोक्तं पूर्वशास्त्रेषु
सांप्रतमयनं सवितुः कर्कटकाद्यं मृगादितश्चान्यत्
उक्ताभावो विकृतिः प्रत्यक्षपरीक्षणैर्व्यक्तिः

XXVIII.

ON THE SPIKENARD OF THE ANTIENTS.

BY THE PRESIDENT.

IT is painful to meet perpetually with words that convey no diſtinct ideas; and a natural deſire of avoiding that pain excites us often to make inquiries, the reſult of which can have no other uſe than to give us clear conceptions. Ignorance is to the mind what extreme darkneſs is to the nerves: both cauſe an uneaſy ſenſation; and we naturally love knowledge as we love light, even when we have no deſign of applying either to a purpoſe eſſentially uſeful. This is intended as an apology for the pains which have been taken to procure a determinate anſwer to a queſtion of no apparent utility, but which ought to be readily anſwered in *India*: "What is *Indian* Spikenard?" All agree that it is an odoriferous plant, the beſt ſort of which, according to *Ptolemy*, grew about *Rangamritica* or *Rangamati*, and on the borders of the country now called *Butan*. It is mentioned by *Dioſcorides*, whoſe work I have not in my poſſeſſion; but his deſcription of it muſt be very imperfect, ſince neither *Linnæus* nor any of his diſciples pretend to claſs it with certainty; and, in the lateſt botanical work that we have received from *Europe*, it is marked as *unknown*. I had no doubt, before I was perſonally acquainted with *Koenig*, that he had aſcertained it; but he aſſured me that he knew not what the *Greek* writers meant by the nard of *India*; he had found, indeed, and deſcribed a ſixth ſpecies of the nardus, which is called *Indian* in the Supplement

to *Linnæus*; but the *nardus* is a graſs which, though it bear a *ſpike*, no man ever ſuppoſed to be the *true* Spikenard, which the great botanical philoſopher himſelf was inclined to think a ſpecies of *Andropogon*, and places in his *Materia Medica*, but with an expreſſion of doubt, among his polygamous plants. Since the death of *Koenig* I have conſulted every botaniſt and phyſician with whom I was acquainted, on the ſubject before us; but all have confeſſed without reſerve, though not without ſome regret, that they were ignorant what was meant by the *Indian* Spikenard.

In order to procure information from the learned natives, it was neceſſary to know the *name* of the plant in ſome *Aſiatic* language. The very word *nard* occurs in the *Song of Solomon*; but the name and the thing were both exotic: the *Hebrew* lexicographers imagine both to be *Indian*; but the word is in truth *Perſian*, and occurs in the following diſtich of an old poet:

An chu bikheſt, in chu nardeſt, an chu ſhakeſt, in chu bar,
An chu bikhi payidareſt, in chu nardi payidar.

It is not eaſy to determine in this couplet, whether *nard* means the *ſtem*, or, as *Anju* explains it, the *pith*; but it is manifeſtly a part of a vegetable, and neither the *root*, the fruit, nor the *branch*, which are all ſeparately named. The *Arabs* have borrowed the word *nard* but in the ſenſe, as we learn from the *Kamis*, of a *compound medical unguent*. Whatever it ſignified in old *Perſian*, the *Arabic* word *ſumbul*, which, like *ſumbalah*, means an *ear* or *ſpike*, has long been ſubſtituted for it; and there can be no doubt that, by the *ſumbul* of *India* the *Muſelmans* underſtand the ſame plant with the *nard* of *Ptolemy* and the *Nardoſtachys*, or *Spikenard*, of *Galen*; who, by the way,

was deceived by the dry ſpecimens which he had ſeen, and miſtook them for *roots*.

A ſingular deſcription of the *ſumbul* by *Abu'lfazl*, who frequently mentions it as an ingredient in *Indian* perfumes, had for ſome time almoſt convinced me that the true *Spikenard* was the *Cetaca*, or *Pandanus* of our botaniſts; his words are, *Sumbul panj berg dared, ceh dirazii an dah angoſhteſtu pahnai, ſeh*, or, "The *ſumbul* has five leaves, ten fingers long, and "three broad." Now I well knew that the miniſter of *Acbar* was not a botaniſt, and might eaſily have miſtaken a thyrſus for a ſingle flower: I had ſeen no bloſſom, or aſſemblage of bloſſoms, of ſuch dimenſions, except the male *Cetaca*; and, though the *Perſian* writer deſcribes the female as a different plant, by the vulgar name *Cyora*, yet ſuch a miſtake might naturally have been expected in ſuch a work: but what moſt confirmed my opinion, was the exquiſite fragrance of the *Cetaca*-flower, which to my ſenſe far ſurpaſſed the richeſt perfumes of *Europe* or *Aſia*. Scarce a doubt remained, when I met with a deſcription of the *Cetaca* by *Forſkohl*, whoſe words are ſo perfectly applicable to the general idea which we are apt to form of *Spikenard*, that I give you a literal tranſlation of them:—"The *Pandanus* is an incomparable "plant, and cultivated for its odour, which it breathes "ſo richly, that one or two *Spikes*, in a ſituation ra"ther humid, would be ſufficient to diffuſe an odo"riferous air for a long time through a ſpacious "apartment; ſo that the natives in general are not "ſolicitous about the living plants, but *purchaſe the* "*ſpikes at a great price.*" I learned alſo, that a fragrant eſſential oil was extracted from the flowers; and I produced from *Banares* a large phial of it, which was adulterated with ſandal; but the very adulteration convinced me, that the genuine eſſence muſt be valuable, from the great number of thyrſi that muſt be

required in preparing a ſmall quantity of it. Thus had I nearly perſuaded myſelf, that the true nard was to be found on the banks of the *Ganges*, where the *Hindu* women roll up its flowers in their long black hair after bathing in the holy river; and I imagined, that the *precious alabaſter-box* mentioned in the ſcripture, and the *ſmall onyx*, in exchange for which the poet offers to entertain his friend with *a caſk of old wine*, contained an eſſence of the ſame kind, though differing in its degree of purity with the nard which I had procured; but an *Arab* of *Mecca*, who ſaw in my ſtudy ſome flowers of the *Cetaca*, informed me that the plant was extremely common in *Arabia*, where it was named *Cadhi*; and ſeveral *Mahomedans* of rank and learning have ſince aſſured me, that the true name of the *Indian Sumbul* was not *Cetaca*, but *Jatamanſi*. This was important information: finding, therefore, that the *Pandanus* was not peculiar to *Hinduſtan*, and conſidering that the *Sumbul* of *Abulfazl* differed from it in the preciſe number of leaves on the thyrſus, in the colour, and in the ſeaſon of flowering, though the length and breadth corresponded very nearly, I abandoned my firſt opinion, and began to inquire eagerly for the *Jatamanſi*, which grew, I was told, in the garden of a learned and ingenious friend, and fortunately was then in bloſſom. A freſh plant was very ſoon brought to me. It appeared on inſpection to be a moſt elegant *Cypirus* with a poliſhed three-ſided culm, an umbella with three or four enſiform leaflets minutely ſerrated, naked proliferous peduncles, crowded ſpikes, expanded daggers; and its branchy root had a pungent taſte with a faint aromatic odour; but no part of it bore the leaſt reſemblance to the drug known in *Europe* by the appellation of *Spikenard*; and a *Muſelman* phyſician from *Dehli* aſſured me poſitively, that the plant was not *Jatamanſi*, but *Sud*, as it is named in *Arabic*, which the author of the *Tohfatu'l Mumenin* particularly diſtinguiſhes from the *Indian Sumbul*. He produced on

the next day an extract from the Dictionary of Natural History, to which he had referred; and I present you with a translation of all that is material in it.

" 1. *Sud* has a roundish olive-shaped root, exter-
" nally black, but white internally, and so fragrant as
" to have obtained in *Persia* the name of *Subterranean*
" *Musk*: its leaf has some resemblance to that of a
" leek, but is longer and narrower, strong, somewhat
" rough at the edges, and tapering to a point. 2. *Sum-*
" *bul* means a *spike* or *ear*, and was called *nard* by
" the *Greeks*. There are three sorts of *Sumbul* or
" *Nardin*; but, when the word stands alone, it means
" the *Sumbul* of *India*, which is an herb *without flower*
" *or fruit* (he speaks of the drug only) like the tail
" of an ermine, or of a small weasel, but not quite so
" thick, and about the length of a finger. It is dark-
" ish, inclining to yellow, and very fragrant; it is
" brought from *Hindustan*; and its medical virtue
" lasts three years." It was easy to procure the dry *Jatamansi*, which corresponded perfectly with the description of the *Sumbul*; and though a native *Muselman* afterwards gave me a *Persian* paper, written by himself, in which he represents the *Sumbul* of *India*, the *Sweet Sumbul*, and the *Jatamansi*, as three different plants, yet the authority of the *Tohfatu'l Mumenin* is decisive that the *Sweet Sumbul* is only another denomination of nard; and the physician who produced that authority, brought as a specimen of *Sumbul*, the very same drug which my *Pandit*, who is also a physician, brought as a specimen of the *Jatamansi*. A *Brahmen* of eminent learning gave me a parcel of the same sort, and told me that it was used in their sacrifices; that, when fresh, it was exquisitely sweet, and added much to the scent of rich essences, in which it was a principal ingredient; that the merchants brought it from the mountainous country to the north-east of *Bengal*; that it was the entire plant,

not a part of it, and received its *Sanſcrit* names from its reſemblance to *locks of hair*; as it is called *Spikenard*, I ſuppoſe, from its reſemblance to a ſpike when it is dried, and not from the configuration of its flowers, which the *Greeks*, probably, never examined. The *Perſian* author deſcribes the whole plant as reſembling the tail of an ermine; and the *Jatamanſi*, which is manifeſtly the *Spikenard* of our druggiſts, has preciſely that form, conſiſting of withered ſtalks and ribs of leaves, cohering in a bundle of yellowiſh brown capillary fibres, and conſtituting a ſpike about the ſize of a ſmall finger. We may, on the whole, be aſſured, that the *nardus* of *Ptolemy*, the *Indian Sumbul* of the *Perſians* and *Arabs*, the *Jatamanſi* of the *Hindus*, and the *Spikenard* of our ſhops, are one and the ſame plant; but to what claſs and genus it belongs in the *Linnæan* ſyſtem, can only be aſcertained by an inſpection of the freſh bloſſoms. Dr. *Patrick Ruſſel*, who always communicates with obliging facility his extenſive and accurate knowledge, informed me by letter, that "Spikenard is carried over the de-
"ſert" (from *India*, I preſume) "to *Aleppo*, where
"it is uſed in ſubſtance, mixed with other perfumes,
"and worn in ſmall bags, or in the form of eſſence,
"and kept in little boxes or phials, like *atar* of roſes."
He is perſuaded, and ſo am I, that the *Indian* nard of the antients and that of our ſhops, is one and the ſame vegetable.

Though diligent reſearches have been made at my requeſt on the borders of *Bengal* and *Behar*, yet the *Jatamanſi* has not been found growing in any part of the *Britiſh* territories. Mr. *Saunders*, who met with it in *Butan*, where, as he was informed, it is very common, and whence it is brought in a dry ſtate to *Rangpur*, has no heſitation in pronouncing it a ſpecies of the *Baccharis*; and, ſince it is not poſſible that he could miſtake the *natural order* and

essential character of the plant, which he examined, I had no doubt that the *Jatamansi* was composit and corymbiferous with stamens connected by the anthers, and with female prolific florets, intermixed with hermaphrodites. The word *Spike* was not used by the antients with botanical precision, and the *Stachys* itself is verticillated with only two species out of fifteen, that could justify its generic appellation. I therefore concluded that *the true Spikenard* was a *Baccharis*, and that, while the philosopher had been searching for it to no purpose,

——————————— the dull swain
Trod on it daily with his clouted shoon ;

for the *Baccharis*, it seems, as well as the *Conyza*, is called by the gardeners, *Ploughman's Spikenard.* I suspected, nevertheless, that the plant which Mr. *Saunders* described was not *Jatamansi*; because I knew that the people of *Butan* had no such name for it, but distinguished it by very different names in different parts of their hilly country: I knew also that the *Butias*, who set a greater value on the drug than it seems, as a perfume, to merit, were extremely reserved in giving information concerning it, and might be tempted, by the narrow spirit of monopoly, to mislead an inquirer for the fresh plant. The friendly zeal of Mr. *Purling* will probably procure it in a state of vegetation; for, when he had the kindness, at my desire, to make enquiries for it among the *Butan* merchants, they assured him, that the living plants could not be obtained without an order from their sovereign the *Devaraja*, to whom he immediately dispatched a messenger with an earnest request, that eight or ten of the growing plants might be sent to him at *Rangpur*. Should the *Devaraja* comply with that request, and should the vegetable flourish in the plain of *Bengal*, we shall have ocular proof of its class, order, genus, and species; and if it prove the same with the

Jatamanſi of *Nepal*, which I now muſt introduce to your acquaintance, the queſtion with which I began this eſſay will be ſatisfactorily anſwered.

Having traced the *Indian* Spikenard, by the name of *Jatamanſi*, to the mountains of *Nepal*, I requeſted my friend Mr. *Law*, who then reſided at *Gaya*, to procure ſome of the recent plants by the means of the *Nepaleſe* pilgrims; who, being orthodox *Hindus*, and poſſeſſing many rare books in the *Sanſcrit* language, were more likely than the *Butias* to know the true *Jatamanſi*, by which name they generally diſtinguiſh it. Many young plants were accordingly ſent to *Gaya*, with a *Perſian* letter ſpecifically naming them, and apparently written by a man of rank and literature; ſo that no ſuſpicion of deception or of error can be juſtly entertained. By a miſtake of the gardener they were *all* planted at *Gaya*, where they have bloſſomed, and at firſt ſeemed to flouriſh. I muſt therefore deſcribe the *Jatamanſi* from the report of Mr. *Burt*, who favoured me with a drawing of it, and in whoſe accuracy we may perfectly confide; but, before I produce the deſcription, I muſt endeavour to remove a prejudice, in regard to the *natural order* of the Spikenard, which they, who are addicted to ſwear by every word of their maſter *Linnæus*, will hardly abandon; and which I, who love truth better than him, have abandoned with ſome reluctance. *Nard* has been generally ſuppoſed to be a *graſs*; and the word *ſtachys* or *ſpike*, which agrees with the habit of their natural order, gave riſe, perhaps, to the ſuppoſition. There is a plant in *Java*, which moſt travellers and ſome phyſicians call *ſpikenard*; and the Governor of *Chinſura*, who is kindly endeavouring to procure it thence in a ſtate fit for examination, writes me word, that a "*Dutch* author pronounces it a *graſs like the Cypirus*, "but inſiſts that what we call the *ſpike* is the fibrous "part above the root, as long as a man's little finger,

" of a browniſh hue inclining to red or yellow, rather
" fragrant, and with a pungent, but aromatic ſcent."
This is too ſlovenly a deſcription to have been written
by a botaniſt; yet I believe the latter part of it to be
tolerably correct, and ſhould imagine that the plant
was the ſame with our *Jatamanſi*, if it were not commonly
aſſerted that the *Java* ſpikenard was uſed as
a condiment; and if a well informed man, who had
ſeen it in the iſland, had not aſſured me that it was a
ſort of *Pimento*, and conſequently a ſpecies of *Myrtle*,
and of the order now called *Heſperian*. The reſemblance
before mentioned between the *Indian ſumbul*
and the *Arabian Sud*, or *Cypirus*, had led me to ſuſpect
that the true nard was a *graſs* or a *reed*; and, as
this country abounds in *odoriferous graſſes*, I began to
collect them from all quarters. Colonel *Kyd* obligingly
ſent me two plants with ſweet-ſmelling roots;
and, as they were known to the *Pandits*, I ſoon found
their names in a *Sanſcrit* dictionary; one of them is
called *gandhaſat'hi*, and uſed by the *Hindus* to ſcent
the red powder of *Sapan*, or *Bakkam*-wood, which they
ſcatter in the feſtival of the vernal ſeaſon; the other
has many names, and, among them, *nagaramaſtac*
and *gonarda*; the ſecond of which means *ruſtling in
the water*; for all the *Pandits* inſiſt that *nard* is never
uſed as a noun in *Sanſcrit*, and ſignifies, as the root
of a verb, *to ſound* or *to ruſtle*. Soon after, Mr. *Burrow*
brought me, from the banks of the *Ganges* near
Heridwar, a very fragrant graſs, which in ſome places
covers whole acres, and diffuſes, when cruſhed, ſo
ſtrong an odour, that a perſon, he ſays, might eaſily
have ſmelt it, as *Alexander* is reported to have ſmelt
the nard of *Gedroſia* from the back of an elephant:
its bloſſoms were not preſerved, and it cannot, therefore,
be deſcribed. From Mr. *Blane* of *Lucnow*, I
received a freſh plant, which has not flowered at *Calcutta*;
but I rely implicitly on his authority, and have
no doubt that it is a ſpecies of *Andropogon*: it has

rather a rank aromatic odour, and, from the virtue aſcribed to it of curing intermittent fevers, is known by the *Sanſcrit* name of *jwarancuſa*, which literally means a *fever-hook*, and alludes to the *iron-hook* with which the elephants are managed. Laſtly, Dr. *Anderſon* of *Madras*, who delights in uſeful purſuits and in aſſiſting the purſuits of others, favoured me with a complete ſpecimen of the *Andropogon Nardus*, one of the moſt common graſſes on the coaſt, and flouriſhing moſt luxuriantly on the mountains, never eaten by cattle, but extremely grateful to bees, and containing an eſſential oil, which, he underſtands, is extracted from it in many parts of *Hinduſtan*, and uſed as an *atar*, or *perfume*. He adds a very curious philological remark, that, in the *Tamul* dictionary, moſt words beginning with *nar* have ſome relation to *fragrance*; as *narukeradu* to yield an odour; *nartum pillu*, lemon-graſs; *nartei*, citron; *narta manum*, the wild orange-tree; *narum panei*, the *Indian Jaſmin*; *narum alleri*, a ſtrong ſmelling flower; and *nartu*, which is put for *nard* in the *Tamul* verſion of our Scriptures; ſo that not only the *nard* of the *Hebrews* and *Greeks*, but even the *copia narium* of *Horace*, may be derived from an *Indian* root. To this I can only ſay, that I have not met with any ſuch root in *Sanſcrit*, the oldeſt poliſhed language of *India*; and that in *Perſian*, which has a manifeſt affinity with it, *nar* means a *pomegranate*, and *nargil* (a word originally *Sanſcrit*) a *cocoa-nut*; neither of which has any remarkable fragrance.

Such is the evidence in ſupport of the opinion given by the great *Swediſh* naturaliſts, that the true nard was a gramineous plant, and a ſpecies of *Andropogon*; but ſince no graſs that I have yet ſeen bears any reſemblance to the *Jatamanſi*, which I conceive to be the *nardus* of the antients, I beg leave to expreſs my diſſent, with ſome confidence as a philologer, though with humble diffidence as a ſtudent in botany. I am not, indeed, of opinion that the *nardum* of the *Romans*

was merely the eſſential oil of the plant from which it was denominated, but am ſtrongly inclined to believe that it was a *generic* word, meaning what we now call *atar*, and either the *atar* of roſes from *Caſhmir* and *Perſia*, that of *Cetaca*, or *Pandanus*, from the weſtern coaſt of *India*, or that of *Aguru*, or aloe-wood, from *Aſam* or *Cochinchina*, the proceſs of obtaining which is deſcribed by *Abulfazl*, or the mixed perfume, called *abir*, of which the principal ingredients were yellow ſandal, violets, orange-flowers, wood of aloes, roſe-water, muſk, and true Spikenard: all thoſe eſſences and compoſitions were coſtly; and, moſt of them being ſold by the *Indians* to the *Perſians* and *Arabs*, from whom, in the time of *Octavius*, they were received by the *Syrians* and *Romans*, they muſt have been extremely dear at *Jeruſalem* and at *Rome*. There might alſo have been a pure *nardine oil*, as *Athenæus* calls it; but *nardum* probably meant (and *Koenig* was of the ſame opinion) an *Indian* eſſence *in general*, taking its name from that ingredient which had, or was commonly thought to have, the moſt exquiſite ſcent. But I have been drawn by a pleaſing ſubject to a greater length than I expected, and proceed to the promiſed deſcription of the *true nard* or *Jatamanſi*, which, by the way, has other names in the *Amarcoſh*, the ſmootheſt of which are *jatila* and *lomaſa*, both derived from words meaning *hair*. Mr. *Burt*, after a modeſt apology for his imperfect acquaintance with the language of botaniſts, has favoured me with an account of the plant, on the correctneſs of which I have a perfect reliance, and from which I collect the following *natural characters*:

AGGREGATE.

Cal. Scarce any. *Margin* hardly diſcernible.

Cor. One petal. *Tube* ſomewhat gibbous. *Border* five cleft.

Stam. Three *anthers*.

Piſt. *Germ* beneath. One *ſtyle* erect.

Seed ſolitary, crowned with a pappus.
Root fibrous.
Leaves hearted, fourfold ; *radical* leaves petioled.

It appears, therefore, to be the *Protean* plant, *Valerian*, a ſiſter of the Mountain and *Celtic* Nard, and of a ſpecies which I ſhould deſcribe in the *Linnæan* ſtyle, *Valeriana Jatamanſi floribus triandris, foliis cordatis quaternis, radicalibus petiolatis.* The radical leaves, riſing from the ground and enfolding the young ſtem, are plucked up with a part of the root, and, being dried in the ſun, or by an artificial heat, are ſold as a drug, which from its appearance has been called *ſpikenard*; though, as the *Perſian* writer obſerves, it might be compared more properly to the *tail of an ermine.* When nothing remains but the dry fibres of the leaves, which retain their original form, they have ſome reſemblance to a *lock of hair*, from which the *Sanſcrit* name, it ſeems, is derived. Two mercantile agents from *Butan* on the part of the *Devaraja* were examined, at my requeſt, by Mr. *Harington*; and informed him that the drug, which the *Bengaleſe* called *Jatamanſi*, "grew erect above the "ſurface of the ground, reſembling in colour an ear "of green wheat; that, when recent, it had a faint "odour, which was greatly increaſed by the ſimple "proceſs of drying it; that it abounded on the hills, "and even on the plains, of *Butan*, where it was "collected and prepared for medicinal purpoſes." What its virtues are, experience alone can aſcertain; but, as far as botanical analogy can juſtify a conjecture, we may ſuppoſe them to be antiſpaſmodic; and, in our provinces, eſpecially in *Behar*, the plant will probably flouriſh; ſo that we may always procure it in a ſtate fit for experiment. On the deſcription of the *Indian* Spikenard, compared with the drawing, I muſt obſerve, that, though all the leaves, as delineated, may not appear of the ſame ſhape, yet all of

them are not fully expanded. Mr. *Burt* aſſures me that the four radical leaves are *hearted and petioled*; and it is moſt probable, that the cauline and floral leaves would have a ſimilar form in their ſtate of perfect expanſion; but, unfortunately, the plants at *Gaya* are now ſhrivelled; and they who ſeek farther information, muſt wait with patience until new ſtems and leaves ſhall ſpring from the roots, or other plants ſhall be brought from *Nepal* and *Butan*. On the propoſed inquiry into the virtues of this celebrated plant, I muſt be permitted to ſay, that, although many botaniſts may have waſted their time in enumerating the qualities of vegetables, without having aſcertained them by repeated and ſatisfactory experiments, and although *mere botany* goes no farther than technical arrangement and deſcription, yet it ſeems indubitable that the great end and aim of a botanical philoſopher is to diſcover and prove the ſeveral uſes of the vegetable ſyſtem; and, while he admits with *Hippocrates* the *fallaciouſneſs of experience*, to rely on experiment alone as the baſis of his knowledge.

APPENDIX.

A

METEOROLOGICAL DIARY,

KEPT AT CALCUTTA,

By HENRY TRAIL, Esq.

From 1st February 1784, to 31st Decem. 1785.

REMARKS.

IN the following Diary of the Weather, begun the 1st of February 1784, every change in the air was marked down with the greatest precision three times every day, and always nearly at the same hours, viz. at sun-rising at three, or half past three o'clock in the afternoon, and at eleven o'clock at night.

While the wind continued southerly, the Thermometer was placed in a Verandah open to the Esplanade, where there was at all times a free circulation of air; and when the wind became northerly, the instrument was removed to the opposite side of the house, and equally exposed, as in the preceding part of the year.

The Barometer continued always in the same place.

The Hygrometer made use of, was a bit of fine sponge, suspended in a scale (on the end of a steel-yard) first prepared for more easily imbibing the moisture, by dipping it in a solution of Salt of Tartar, afterwards drying it well, and bringing it to an equilibrium by a weight in the opposite scale, at a time when the atmosphere appeared to have the least degree of moisture.

A semicircular scale at the top, divided from 0 to 90° on each side, with the needle of the yard, pointed out the quantity of moisture gained or lost daily; but in the following Diary the degrees of moisture have seldom been taken down.

ABSTRACT OF A METEOROLOGICAL REGISTER, KEPT AT CALCUTTA, 1784.

MONTH.	THERMOMETER.									Difference between morn. & mid-day heat.	BAROMETER.												Mean state of the atmosphere.			Moisture.			Appearance atmosphere.		Thunder No. of times.	Winds.	
	Morning.			Noon.			Evening.				Morning.				Noon.				Evening.														
	Lowest.	Highest.	Mean.	Lowest.	Highest.	Mean.	Lowest.	Highest.	Mean.		Lowest.	Highest.	Mean.	Variation.	Lowest.	Highest.	Mean.	Variation.	Lowest.	Highest.	Mean.	Variation.	Temperature.	Weight.	Density.	Moisture.	Rainy days.	Quant. of rain.	Number clear days.	Cloudy do.		Point.	Force.
February,	66	75	72	70	86	79	68	76	73	7													$74\frac{2}{3}$		700	6	8	4.2	3	26	6	S	2
March,	66	84	75	75	89	84	71	85	79	9													$79\frac{1}{3}$		692	5	3	1.8	16	15	3	S	3
April,	71	89	83	87	97	91	79	87	85	8													$86\frac{1}{3}$		681	10	6	3.1	14	16	6	S	4
May,	75	85	81	82	93	89	74	88	84	8													$84\frac{2}{3}$		683	15	12	9.6	7	24	13	S	2
June,	77	84	81	80	90	85	78	86	83	4													83		686	25	14	17.4	1	29	5	SE	1
July,	77	84	81	77	90	85	78	85	83	4													83		686	25	20	15.	1	30	5	S&SE	1
August,	77	83	81	80	89	85	80	84	82	4	29.57	29.75	29.67	.18	29.56	29.75	29.66	.19	29.61	29.76	29.70	.15	$82\frac{2}{3}$	29.67	686	25	23	16.9	5	26	15	S&SE	1
September,	76	84	80	77	90	85	78	85	$81\frac{1}{2}$	5	.72	.95	.81	.23	.68	.90	.80	.22	.75	.97	.83	.22	$82\frac{1}{3}$	.81	690	24	12	11.3	10	20	5	S&SE	1
October,	74	83	79	77	90	86	76	85	82	7	.74	30.04	.92	.30	.77	30.00	.91	.23	.70	30.02	.92	.26	$82\frac{2}{3}$	.91	692	2	3	.8	19	12	1	NW	1
November,	66	78	71	76	86	81	71	80	75	10	.60	.12	30.00	.52	.88	.05	.99	.17	.92	.08	30.02	.16	76	30.00	702		1	.9	23	7		NW	1
December,	58	69	63	68	79	74	65	73	68	-11	30.02	.17	.09	.15	30.00	.14	30.07	.14	30.02	.17	.09	.15	$68\frac{2}{3}$	.08	718		1	0.5	26	5		NW	1
Jan. 1785.	57	70	61	69	78	72	64	74	$66\frac{1}{2}$	11	29.98	.17	.08	.19	29.97	.14	.07	.17	.03	.17	.09	.14	$66\frac{2}{3}$	.08	722				29	2		SW	2
Mean.	70	$80\frac{5}{12}$	$75\frac{5}{12}$	$76\frac{6}{12}$	88	83	$73\frac{6}{12}$	$82\frac{6}{12}$	$78\frac{4}{12}$	$7\frac{4}{12}$	29.77	30.03	29.93	.20	29.81	30.00	29.92	.19	29.85	30.03	29.94	.18	79	29.92	695		105	81.0	154	212	59		2

ABSTRACT OF A METEOROLOGICAL REGISTER, KEPT AT CALCUTTA, 1785.

MONTH.	THERMOMETER.									Difference between morn. & mid-day heat.	BAROMETER.												Mean state of the atmosphere.			Moisture.			Appearance atmosphere.		Thunder No. of times.	Winds.	
	Morning.			Noon.			Evening.				Morning.				Noon.				Evening.														
	Lowest.	Highest.	Mean.	Lowest.	Highest.	Mean.	Lowest.	Highest.	Mean.		Lowest.	Highest.	Mean.	Utmost Variation.	Lowest.	Highest.	Mean.	Variation.	Lowest.	Highest.	Mean.	Variation.	Temperature.	Weight.	Density.	Moisture.	Number of rainy days.	Quant. of rain.	Number clear days.	Cloudy do.		Point.	Force.
January,	57	70	61	69	78	72	64	74	66	11	29.98	30.17	30.08	.19	29.97	30.14	30.07	.17	30.03	30.17	30.09	.14	$66\frac{2}{3}$	30.08	722				29	2		SW	2
February,	68	74	71	75	86	79	69	76	74	$8\frac{1}{2}$	.89	.14	.02	.25	.89	.17	.01	.28	29.96	.15	.04	.19	75	.02	706				17	11		SW	1
March,	68	80	75	80	90	85	73	83	78	10	.85	.12	29.95	.27	.84	.10	29.92	.26	.86	.13	29.97	.27	79	29.95	698		4	2.9	20	11	4	S	3
April,	69	83	79	75	91	85	74	85	82	8	.70	29.97	.83	.27	.68	29.92	.81	.24	.74	29.97	.86	.23	$82\frac{1}{2}$	.83	690		3	0.5	17	13	5	S	3
May,	79	87	83	87	94	90	80	89	85	7	.60	.96	.77	.36	.53	.92	.74	.39	.63	30.03	.82	.30	86	.77	682		6	8.0	18	13	6	S	2
June,	79	84	81	80	90	84	79	85	82	3	.44	.70	.59	.26	.40	.68	.56	.28	.47	29.72	.61	.26	83	.58	684		10	6.0	4	26	14	SE	1
July,	79	84	81	80	89	84	80	87	82	3	.44	.73	.59	.29	.45	.67	.56	.22	.47	.73	.62	.26	83	.59	684		24	24.4	4	27	16	SE	1
August,	79	84	81	80	89	84	80	86	82	3	.50	.78	.62	.28	.49	.72	.59	.23	.57	.78	.64	.26	83	.62	685		24	12.8	3	28	11	SE	1
September,	80	84	81	81	89	85	80	85	82	4	.62	.83	.71	.21	.59	.82	.68	.23	.66	.87	.75	.21	83	.71	686		20	9.3	8	22	16	S	1
October,	77	84	81	82	88	85	79	85	83	4	.83	.98	.90	.15	.81	.96	.87	.15	.85	.98	.96	.13	83	.91	691		16	11.7	21	10	13	NW	1
November,	67	80	73	74	85	78	71	82	75	5	.90	30.10	.99	.20	.82	30.08	.98	.26	.80	30.12	30.00	.32	75	.98	705		7	1.4	26	4	4		2
December.	63	70	66	71	76	73	66	73	69	7	.97	.09	30.02	.12	.90	.06	.98	.16	.99	.10	.03	.14	69	30.01	716		4	0.5	31		0		1
Tot. Mean	$72\frac{1}{12}$	$80\frac{4}{12}$	$76\frac{2}{12}$	$77\frac{10}{12}$	$87\frac{1}{12}$	$82\frac{5}{12}$	$74\frac{7}{12}$	$82\frac{6}{12}$	$78\frac{6}{12}$	6	29.73	29.96	29.83	.24	29.70	29.94	29.81	.24	29.75	29.96	[illegible]	[illegible]	77	29.84	696		118	77.5	198	167	89		2

tion of the winds has more effect upon it, as we never fail to see the mercury highest when the wind blows from the NW; in a lesser degree from the N, and lowest of all when it proceeds from the SE quarters.

Every fall of rain was likewiſe taken, and the quantity in cubic inches daily noted down.

The winds were alſo obſerved, and the figures 0, 1, 2, 3, 4, denote the force thereof.

Here it may be remarked, that at ſun-riſing, there is ſeldom or ever any wind; but no ſooner is the air a little rarefied by its rays, than a little breeze begins, and this generally increaſes till about noon, when again it begins to loſe its force, and dies away, from the ſame cauſe.

In order to aſcertain the influence of the Moon upon the weather, the mean temperature, as well as the weight of the atmoſphere of each quarter, is accurately marked down by taking in the three days preceding, and the three days after the change with the intermediate day. From theſe the denſity is diſcovered by the following rule, given by Dr. *Bradely*, viz.

A, altitude of barometer; B, altitude of thermometer; D, denſity.

$$\frac{A}{B \times 350} = D \text{ — or denſity.}$$

N. B. In this the mean morning denſity is only taken. However, the mean denſity for the whole may be found by the ſame rule.

January 1, 1785. From an examination of one year's obſervations on the influence of the Moon on the mercury in the Barometer, it does not appear that there is any certain rule to be laid down regarding it. However, it may be affirmed that the direc-

Calcutta, February 1784.

Days.	Thermometer.			Mean morning denſity of each quarter of the Moon.	Rain Inch.	Wind.		Appearance of the air.	Remarks.
	M.	N.	E.			Points.	Force.		
1	68	75	72			W	0	Cloudy,	Sunday.
2	68	78	72			N	0	ditto,	Heavy, with a great appearance of rain.
3	67	74	69			NE	0	ditto,	ditto.
4	68	77	68			S	0	ditto,	ditto.
5	71	79	72			SW	1	ditto,	ditto.
6	72	80	74	Full Moon 70 3-7ths		NW	1	ditto,	A thick fog all day.
7	71	82	75			S	2	Clear,	
8	70	80	74		.1		1	Cloudy,	Some hail in the afternoon, with thunder.
9	74	80	75				2	ditto,	
10	75	80	74				2	ditto,	A great appearance of rain, very dark.
11	71	77	75				1	ditto,	
12	73	79	76		.2	NW	1	ditto,	ditto, a few drops of rain.
13	73	80	74		.1	S	3	ditto,	ditto.
14	74	80	75	L. Q. 71 6-7ths	.1	NW	2	ditto,	ditto.
15	70	82	72				1	ditto,	Much thunder this morning, with a heavy ſhower.
16	72	78	74		0.5	S	2	ditto,	
17	70	81	72				0	Clear,	
18	69	76	72			var.	1	Hazy,	
19	69	79	74			S	0	ditto,	A few drops of rain.
20	70	77	75			W	2	ditto,	
21	73	77	74	New Moon 70 3-7ths			1	Cloudy,	Very gloomy, and a great appearance of rain, very
22	70	75	73			W	0	Hazy,	cloſe, no ſun all day.
23	70	83	75			N	0	ditto,	
24	72	84	74				0	Cloudy,	ditto.
25	71	76	73		0.5		1	ditto,	Clear at intervals.
26	68	70	68		.2		0	ditto,	ditto.
27	67	74	69			NW	0	ditto,	Very thick.
28	67	76	71	F. Q. 67 2-7ths	.1	W	1	ditto,	Thunder, very moiſt and wet.
29	69	78	71			NW	2	Clear,	Very chilly.
mean	72	79	73		4.2	var.	2	Cloudy.	Mean ſtate of the atmoſphere.

A General State of the Weather for February 1784.

	M.	N.	E.	
Greateſt altitude of the Thermometer,	75°	86	76	74 2-3d Mean temperature.
Leaſt ditto, — —	66	70	68	
Mean ditto, — —	72	79	73	

Clear, — —	3 days.
Cloudy, — —	26 do.
N° of days on which it rained,	8 do.
Quantity of rain, —	4-2 Inch

This month the wind very variable, and the atmoſphere for the moſt part cloudy, and ſometimes ſeveral days ſucceeding without any ſun; the air alſo damp and cold; frequently thunder; and on the 8th there was a fall of hail in the afternoon, accompanied with thunder.

The mornings generally foggy.

Calcutta, March 1784.

Days.	Thermometer.			Mean morning heat at each quarter of the Moon.	Rain Inch.	Wind.		Appearance of the air.	Remarks.
	M.	N.	E.			Points.	Force.		
1	66	80	71			SW	1	Clear,	Monday.
2	67	80	71			W	1	ditto,	Moist.
3	70	82	76			S	2	ditto,	Thunder, but no rain.
4	72	85	76		.1	W	4	Cloudy,	Thunder, early this morning.
5	73	84	74			SE	0	Hazy,	
6	71	83	74				2	Cloudy,	
7	70	78	74	Full Moon 72 5-7ths			1	ditto,	
8	69	75	74				1	Clear,	Great appearance of rain.
9	70	80	74			S	1	ditto,	
10	70	82	75				0	ditto,	The weather very fine and dry.
11	70	83	75				2	ditto,	ditto.
12	69	85	75			var.	1	ditto,	ditto.
13	70	88	79				3	ditto,	ditto.
14	75	86	81	L. Q. 73 6-7ths		S	1	ditto,	ditto.
15	76	86	80				0	Cloudy,	The morning foggy.
16	79	86	81				0	Clear,	Very close and sultry.
17	78	86	81				0	ditto,	ditto.
18	79	87	83				0	Hazy,	ditto.
19	80	88	83			var.	0	Clear,	ditto.
20	80	86	82				3	Cloudy,	The wind high.
21	77	85	83	New Moon 79 3-7ths	0.3		3	ditto,	ditto, thunder.
22	80	86	83			W	3	Clear,	ditto.
23	80	88	84			S	2	Cloudy,	
24	80	89	83				0	ditto,	Moist.
25	81	88	85				1	ditto,	ditto.
26	83	89	84				1	ditto,	Very thick.
27	84	86	80			var.	1	ditto,	A great appearance of rain.
28	77	82	81	F. Q. 80 2-7ths	0.5	S	4	ditto,	The wind boisterous.
29	78	81	81				3	ditto,	ditto.
30	79	86	83				2	Clear,	ditto.
31	80	84	81				1	ditto,	
mean	75	84	79		1.8	S	S	Clear.	Mean state of the atmosphere.

A General State of the Weather for March.

	M.	N.	E.	
Greateſt altitude of Thermometer,	84	89	85	79 1-3d Mean temperature.
Leaſt ditto, — —	66	75	71	
Mean ditto, — —	75	84	79	

Clear, —	16 days.
Cloudy, —	15 do.
Rain, —	3 do.
Quantity of do. —	1-8 inch.

The wind almoſt continually ſoutherly, and ſtrong blaſts towards the end of the month; the weather throughout clear and ſerene, and heavy dews at night; which indeed muſt always be the caſe when they are preceded by a clear warm ſun.

In blowing weather dews are ſeldom ſeen, the moiſture as it falls being diſpelled by the wind.

The heat of the earth this month about mid-day, about 120°.

Calcutta, April 1784.

Days.	Thermometer.			Mean morning heat at each quarter of the Moon.	Rain.	Wind.		Appearance of the air.	Remarks.
	M.	N.	E.			Point.	Force.		
1	79	89	85			S	1	Clear,	Thursday.
2	81	87	83				0	ditto,	
3	81	91	85				4	Cloudy,	Disagreeable blowing weather.
4	83	89	85				3	ditto,	ditto.
5	83	89	86				3	ditto,	ditto.
6	83	88	85	Full Moon 82 6-7ths			4	Cloudy,	d'tto.
7	83	91	86				3	Hazy,	ditto.
8	83	91	85				2	Clear,	
9	84	92	86				1	ditto,	
10	84	94	87				0	ditto,	
11	85	97	87				0	ditto,	
12	86	95	87				0	ditto,	
13	85	93	85	Last Quarter 84 3-7ths			0	ditto,	The night very close.
14	86	92	83			SE	0	ditto,	ditto.
15	83	91	85			S	3	ditto,	Hard blowing weather, with much dust.
16	83	90	86		0.4		3	Cloudy,	
17	84	89	80		1.5		3	ditto,	ditto.
18	80	88	79		0.5	SW	4	ditto,	A heavy thunder-storm in the evening.
19	74	87	85			NW	2	ditto,	High wind.
20	83	90	85	New Moon 81 3-7ths		S	3	ditto,	Very close.
21	83	91	86				0	Clear,	Strong wind.
22	83	92	85				3	ditto,	Ditto.
23	83	93	87				3	ditto,	Close and sultry,
24	83	92	86				0	Hazy,	
25	84	90	86				3	Clear,	
26	84	89	84		0.4		3	ditto,	With rain and thunder.
27	80	88	85	Full Quarter 83 2-7ths	0.2		4	Cloudy,	ditto, from NW.
28	83	90	87				4	ditto,	ditto. ditto.
29	85	88	85		0.1		2	ditto,	ditto.
30	84	89	85				0	ditto,	High wind.
mean	83	91	85		3.1	S	4	Cloudy.	Mean state of the atmosphere.

A General State of the Weather for April.

	M.	N.	E.	
Greateſt altitude of the Thermometer,	86	97	87	86 1-3d Mean temperature.
Leaſt ditto, — —	71	87	79	
Mean ditto, — —	83	91	85	

Clear,	—	14 days.
Cloudy,	—	16 do.
Rain,	—	6 do.
Quantity of do.	—	3·1 inch.

The prevailing wind this month, as well as the former, ſouth ; the mean heat of the earth at mid-day, 126°. Blowing and heavy weather in general, and frequent thunder-ſtorms about the end, although many of the nights were cloſe and ſultry.

The thunder-ſtorms that generally prevail at this time of the year, always happen in the after-noon or evening, and come from the N.W, and are attended with loud peals and heavy falls of rain. Before theſe ſtorms begin, the clouds become very dark and low ; and the winds being thus confined between the clouds and earth, muſt of courſe be greatly augmented.

Calcutta, May 1784.

Days.	Thermometer. M.	Thermometer. N.	Thermometer. E.	Mean morning heat of each quarter of the Moon.	Rain.	Wind. Point.	Wind. Force.	Appearance of the air.	Remarks.
1	82	86	82		.2	S	3	Cloudy,	Saturday, a violent storm.
2	77	88	74		.1		3	ditto,	Very heavy do. No sun.
3	75	82	79		0.6		4	ditto,	ditto.
4	78	87	84				1	Hazy,	And close.
5	82	89	84	Full Moon 79 6 7ths			1	ditto,	No sun all day.
6	81	90	85		0.5		2	ditto,	A thunder storm in the evening.
7	84	90	85				3	ditto,	High wind at times.
8	82	90	86				3	Clear,	ditto.
9	83	90	87				2	Hazy,	
10	84	90	87		0.4		3	Cloudy,	Very thick and dark.
11	85	89	78			SE	2	ditto,	
12	75	88	84	Last Quarter 79 6-7ths	.0	E	2	ditto,	A thunder storm in the evening.
13	77	85	80		.2	S	1	ditto,	
14	75	85	83			var.	0	ditto,	No wind.
15	80	88	84			S	0	Clear,	
16	80	90	83		0.2		1	ditto,	Thunder in the evening.
17	78	91	86				0	ditto,	The weather very close and still.
18	83	91	87				0	ditto,	ditto.
19	84	90	87	New Moon 82 6-7ths			1	ditto,	ditto.
20	85	92	87				1	Cloudy,	At intervals.
21	85	93	88				0	Clear,	Very still.
22	85	91	85		0.6		2	Cloudy,	Thunder in the evening.
23	84	90	83		0.4		2	ditto,	ditto.
24	82	89	85				2	ditto,	ditto.
25	83	92	86		0.2		1	ditto,	ditto.
26	84	86	84		0.1		2	ditto,	ditto.
27	81	82	83	First Quarter 81 6-7ths	0.2	SE	2	ditto,	ditto.
28	80	86	83			NW	3	ditto,	A great appearance of rain.
29	81	89	84		0.4	NW	2	ditto,	The nights very sultry.
30	82	89	85			NW	3	ditto,	ditto.
31	82	92	86		0.2	S	2	ditto,	Thunder, do.
mean	81	89	84		9.6		2	Cloudy.	Mean state of the atmosphere.

A General State of the Weather for May.

	M.	N.	E.	
Greateſt altitude of the Thermometer,	85	93	88	84 2-3ds Mean temperature.
Leaſt ditto, — —	75	82	74	
Mean ditto, — —	81	89	84	

Clear, —	7 days.
Cloudy, —	24 do.
Rain, —	14 do.
Quantity of do. —	9·6 inches.

The wind ſoutherly, with a few pretty violent ſtorms from the NW, at the beginning of the month, while the latter part was cloſe, gloomy, and warm; but in general, the whole month was exceedingly cloudy, and ſcarcely a ſingle day of bright ſun-ſhine

The rains began on the 22d; and from that day to the end, the nights were very cloſe and ſultry, and the air very damp.

Calcutta, June 1784.

Days.	Thermometer.			Mean heat of each quarter of the Moon.	Rain.	Wind.		Appearance of the air.	REMARKS.
	M.	N.	E.			Points.	Force.		
1	82	82	82	Full Moon 88 3-7ths	0.7	S	1	Cloudy,	Tuesday, thunder.
2	80	86	84		1.2		1	ditto,	
3	82	84	83				1	ditto,	
4	82	85	82		0.2		1	ditto,	A gentle shower.
5	81	87	85			var.	0	ditto,	Close.
6	82	90	85				0	ditto,	
7	83	85	84	Last Quarter 80 1-7ths	0.5		1	ditto,	
8	81	84	82		1.6	NE	1	ditto,	Several showers.
9	80	84	83				0	ditto,	
10	81	82	83		1.1		0	ditto,	No sun all day.
11	79	80	80		1.6	S	1	ditto,	Incessant rain all day.
12	78	78	78		4.6		3	ditto,	ditto.
13	77	80	80		0.1		1	ditto,	
14	80	85	80		0.4		2	ditto,	Thunder in the evening.
15	81	85	82	New Moon 81 1-7ths	0.1	W	2	Hazy,	No sun all day.
16	80	82	79		2.5	var.	1	Cloudy,	ditto.
17	80	83	83		0.8	S	0	ditto,	ditto.
18	81	89	85				1	Hazy,	ditto.
19	81	88	85				1	ditto,	Sun very faint.
20	82	88	86				1	ditto,	Very thick, and no sun.
21	84	90	85			SE	1	ditto,	The night very close.
22	84	88	85	First Quarter 82		SE	1	ditto,	ditto.
23	82	88	85				1	ditto,	ditto.
24	82	90	84				1	ditto,	ditto.
25	83	90	86			var.	0	ditto,	ditto.
26	83	89	84			SE	0	Cloudy,	ditto.
27	82	87	84			S	0	Hazy,	ditto.
28	83	87	83				0	Cloudy,	
29	81	81	81		2.1	var.	1	ditto,	Thunder.
30	81	88	83			S	3	Clear,	High wind.
mean	81	85	83			S & SE	1	Cloudy.	Mean state of the atmosphere.

A General State of the Weather for June.

	M.	N.	E.	
Greateſt altitude of the Thermometer,	84	90	86	
Leaſt ditto, — —	77	80	78	83 Mean temperature.
Mean ditto, — —	81	85	85	

Clear,	—	1 days.
Cloudy,	—	29 do.
Rain,	—	14
Quantity of do.	—	17-4 inches.

The wind, this month, inclining ſometimes to the E of S.; the atmoſphere exceedingly moiſt and wet, and much rain from the 10th to 17th, the ſky moſtly clouded throughout, and very little variation in the temperature of the air.

Calcutta, July 1784.

Days.	Thermometer. M.	N.	E.	Mean morning heat of each quarter of the Moon.	Rain.	Wind. Point.	Force.	Appearance of the air.	Remarks.
1	81	89	84	Thursday.		S	3	Clear,	The wind strong in the morning, but the nights very still and close.
2	83	88	84				2	Cloudy,	
3	83	83	83			SE	2	ditto,	
4	80	86	84	Full Moon 82.			3	ditto,	
5	84	89	84				2	Hazy,	
6	84	88	84		0.4		1	Cloudy,	The night very bright.
7	83	85	84				0	ditto,	ditto, thunder.
8	82	85	84		0.3		0	ditto,	ditto.
9	82	86	84		0.1		1	ditto,	ditto.
10	82	90	85	Last Quarter 82 2-7ths	0.1		1	ditto,	Much lightning in the evening:
11	83	86	83		1.1	var.	1	ditto,	
12	82	86	84		0.9		1	ditto,	Several small showers.
13	83	86	84		0.3		2	ditto,	
14	81	84	82		0.2		1	ditto,	
15	79	83	82		2.6		1	ditto,	Rained all day.
16	82	83	82			SE	0	ditto,	
17	78	83	82		0.9		1	ditto,	Small rain, very dark.
18	79	85	82	New Moon 79 5-7ths	0.1		2	ditto,	On the 7th there had been no rain at Chunar, many persons sick, but chiefly among the natives.
19	79	84	82		0.1		1	ditto,	
20	80	85	81			S	3	ditto,	
21	77	83	80		0.1	SE	1	ditto,	
22	79	84	82		0.3		1	ditto,	
23	80	85	79		1.7		0	ditto,	Much thunder and lightning.
24	79	83	80				1	ditto,	
25	79	83	81		0.1	E	1	ditto,	
26	80	86	82	First Quarter 79 6-7ths	0.1	SE	1	ditto,	Thunder.
27	81	86	83		0.2		1	ditto,	
28	81	86	84			SW	1	ditto,	
29	83	86	83			S	3	ditto,	High winds.
30	81	82	79		1.8	SW	1	ditto,	Thunder.
31	78	77	78		3.6		1	ditto,	Rain all the day.
mean	81	85	83		1.5	S & SE	2	Cloudy.	Mean state of the atmosphere.

A General State of the Weather for July.

	M.	N.	E.	
Greateſt altitude of the Thermometer,	84	90	85	83 Mean temperature.
Leaſt ditto, — —	77	77	78	
Mean ditto, — —	81	85	83	

Clear, —	1 day.
Cloudy, —	30 do.
Rain, —	30 do.
Quantity of ditto, —	15 inches.

The prevailing wind SE, and the atmoſphere, as the former month, exceedingly thick and humid, and very little ſun-ſhine. The mean temperature exactly the ſame as laſt month, and very little variation between the heat at mid-day and that of the morning and evening.

During the rains the wind is often variable, but commonly it comes round to the eaſtward, when there falls much rain.

Calcutta, July 1784.

Calcutta, August 1784.

Days.	Thermometer.			Mean density of each quarter of the Moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
	M.	N.	E.		M.	N.	E.	M. d.	M. m.	N. d.	N. m.	E. d.	E. m.		Point.	M.	N.	E.	
1	77	83	80	F. M. SUNDAY.	29.64	29.64	29.73	10	15	10				1.2	S	0	1	0	Cloudy,
2	80	86	82		.69	.69	.73		15	5				0.4		0	1	0	ditto,
3	81	86	83		.70	.63	.70	15	20		20					1	1	1	ditto,
4	82	88	83		.66	.64	.66	15	25		20			0.4	SE	0	1	0	Clear,
5	82	86	83		.64	.63	.71	15	30		15			0.3	E	1	1	0	Cloudy,
6	81	86	83		.70	.70	.75	12	30	0	0			0.1	SE	1	1	1	ditto,
7	82	86	83	L. Q. 687.	.75	.70	.74	10	40		5			0.2		0	1	0	ditto,
8	81	89	84		.74	.72	.72	10	35		10				S	1	2	1	Clear,
9	82	87	83		.70	.70	.73	15	35		30					0	1	0	ditto,
10	82	87	83		.73	.73	.75	40	40		30		30			1	0	1	ditto,
11	83	82	83		.72	.72	.73		40		40		40	0.4		1	2	0	Cloudy,
12	82	83	81		.70	.72	.74		45	2			8	0.7	SE	1	2	0	ditto,
13	81	87	83		.72	.72	.76		15	10			10			0	1	1	ditto,
14	81	83	81		.73	.73	.77		20		20	10		0.8		1	1	0	ditto,
15	81	83	81	N. M. 689.	.74	.72	.74		10		35		25	0.7	S	0	0	0	ditto,
16	79	84	82		.70	.60	.64		40		35		25	1.5	SE	1	0	0	ditto,
17	81	83	80		.60	.56	.61		25		40		30	2.5		1	1	0	ditto,
18	79	83	80		.58	.56	.64		45		30		40	2.8		0	2	1	ditto,
19	77	80	80		.65	.69	.74		45		45		30	0.8		1	1	1	ditto,
20	78	84	81		.74	.75	.72		40		35		45	0.5		1	2	2	ditto,
21	79	87	83		.72	.63	.69		50		15		35		SW	0	1	0	Clear,
22	80	86	83		.65	.64	.69		45		25		12	1.9		2	0	0	Hazy,
23	82	87	83	F. Q. 689.	.67	.61	.67		30	0	0		20	0.2	S	0	0	0	Cloudy,
24	82	87	84		.64	.59	.66		30	0	0		5		SE	0	1	0	ditto,
25	83	86	84		.64	.64	.64		15	8			5	0.2	E	0	1	1	ditto,
26	81	85	81		.60	.56	.63		10		5	10		0.3	SE	2	2	1	ditto,
27	80	84	81		.60	.59	.62		8		5		6	0.1		2	3	2	ditto,
28	80	85	83		.59	.64	.65		10		15		20	0.2		2	3	2	ditto,
29	81	87	83	F. M. 688.	.64	.68	.68		33	0	0		5	0.6	SW	3	3	3	ditto,
30	81	85	83		.66	.66	.69		20		15		10		SW	2	2	2	ditto,
31	80	84	83		.66	.69	.74		25		25		35	0.1	S	2	2	1	ditto,
mean	81	85	82		29.07	29.66	29 70	3	18	1	18	8	15	16.9	S & SW	1	1 $\frac{1}{3}$	$\frac{2}{3}$	Cloudy.

A General State of the Weather for August.

		M.	N.	E.	
Thermometer,	Greateſt altitude, —	83°	89°	84°	82° 2-3ds Mean temperature.
	Leaſt ditto, — —	77	80	80	
	Mean ditto, — —	81	85	82	
Barometer,	Greateſt ditto, — —	29.75	29.75	29.76	Mean ſtate of the atmoſphere—29.57
	Leaſt ditto, — —	22.57	29.56	29.61	
	Mean ditto, — —	29.67	29.66	29.70	
	Greateſt variation, —	.18	.19	.15	.686 denſity.
	Mean denſity, — —	.688	.682	.688	
Hygrometer,	Greateſt moiſture, —	50°	45°	45°	
	Ditto drought, — —	15	10	10	
	Mean drought and moiſt, —	3d 28m	1d 18m	2d 15m	

Clear, — 5 days.
Cloudy, — 26 do.
Rain, — 23 do.
Quantity of do. — 16-9 inch.

The air ſtill very moiſt and very little ſun-ſhine, although the nights in general were very bright and fine: frequently thunder, and on the 22d an exceeding loud peal early in the morning. The quantity of rain that fell this month was very conſiderable, and every thing imbibing the moiſture to the higheſt degree.

The Barometer is almoſt invariably higher at night than in the morning, and loweſt always at mid-day. The air being much loaded with moiſture the whole of this month, the variation of the mercury was very inſenſible. The ſame cauſes kept the Thermometer nearly ſtationary alſo.

Calcutta, September 1784.

Days.	Thermometer.			Mean denſity at each quarter of the Moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
	M.	N.	E.		M.	N.	E.	M. d.	M. m.	N. d.	N. m.	E. d.	E. m.		Point.	M.	N.	N.	
1	81	86	83	WEDNESDAY.	29.72	29.72	29.79		40		5		20		S	0	1	1	Cloudy,
2	81	89	84		.79	.82	.84		25	5			5		SE	0	1	0	Clear,
3	83	83	82		.84	.81	.84		25		20		25	2.0	SW	0	1	0	Cloudy,
4	81	87	83		.82	.78	.76		35		20		15			1	1	1	Hazy,
5	81	88	83		.74	.78	.75		30		20		20			1	1	0	ditto,
6	82	89	83	Laſt Quarter 691.	.75	.77	.78		20		20		5			0	1	1	Cloudy,
7	81	89	83		.77	.82	.81		25	15	0		20		S	1	1	1	Clear,
8	81	88	83		.80	.83	.80		15	12		10			S	0	1	1	ditto,
9	82	89	84		.79	.72	.78		5	30		5			SW	0	2	0	ditto,
10	82	90	83		.76	.72	.78		5	35		20			SE	0	1	2	ditto,
11	84	90	85		.78	.78	.81	10		40		25			NE	0	2	1	ditto,
12	84	87	84		.81	.80	.79		0	20		20		0.5		0	1	0	Cloudy &c
13	81	87	83	New Moon 691.	.77	.75	.76		25	20		20			N	1	1	0	Heavy,
14	82	84	82		.72	.68	.78		15	10		10			NE	1	1	1	ditto,
15	77	82	80		.77	.80	.80		15	0	0	0		0.7	SE	1	1	1	ditto,
16	79	81	81		.78	.80	.76		20		5		15	0.3		1	1	1	ditto,
17	79	80	79		.93	.70	.78		18		25		30	1.5		1	1	1	ditto,
18	77	81	78		.79	.77	.84		35		38		38	0.9		0	1	1	ditto,
19	76	77	78		.84	.89	.87		50		53		55	1.2		1	2	1	ditto,
20	78	80	79		.88	.89	.91		60		60		55	1.1		1	0	1	ditto,
21	78	80	78	Firſt Quarter 698.	.92	.89	.95		60		55		60	0.3	SE	1	1	1	ditto,
22	79	80	80		.95	.90	.97		60		45		45	1.1	E	1	0	0	ditto,
23	78	83	80		.94	.88	.92		45		30		35	0.1	SE	0	1	0	ditto,
24	79	84	80		.92	.84	.88		40		20		30		S	0	1	0	ditto,
25	79	85	80		.88	.84	.86		35		0		5		SE	0	1	0	ditto,
26	78	86	82		.87	.84	.86		20	20		5			SE	0	1	1	Clear,
27	80	83	79	Full Moon 694.	.80	.84	.80		5		0	5		1.6	var.	0	2	1	Cloudy,
28	79	85	82		.80	.77	.83		15	20		5			S	0	2	1	Clear,
29	80	88	84		.84	.81	.89		10	35		20			SE	0	1	1	ditto,
30	83	89	83		.89	.87	.93	5		35		15				0	1	0	ditto,

A General State of the Weather for September.

		M.	N.	E.	
Thermometer,	Greateſt altitude, —	84°	90°	85°	82½ Mean temperature.
	Leaſt ditto, — —	76	77	78	
	Mean ditto, — —	80	85	81½	
Barometer,	Greateſt ditto, inches, —	29.95	29.90	29.97	Mean ſtate of the atmoſphere—29.81
	Leaſt ditto, — —	29.72	29.68	29.75	
	Mean ditto, — —	29.81	29.80	29.83	
	Greateſt variation, —	0.23	0.22	0.22	
	Mean denſity, — —	.693	.685	.692	.690 denſity.
Hygrometer,	Greateſt moiſture, —	60°	60°	60°	
	Ditto drought, — —	10	40	25	
	Mean drought and moiſt, —	½d 24m	10d 14m	5d 15m	

Clear, — 10 days.
Cloudy, — 20 do.
Rain, — 12 do.
Quantity do. — 11-3 inches.

The wind generally S and SE, much lightning in the evenings, but not attended either with rain or thunder. The air ſtill damp and cloudy, although the Barometer ſtood conſiderably higher than the preceding month.

It is worthy of obſervation, that upon the rains going off, the water falls in larger drops than at any other period of the ſeaſon, and probably this may be occaſioned from the height it has to fall: and in proof of this, the oppoſite ſtations of the Barometer need only be conſulted, where it appears that the weight of the atmoſphere was greatly increaſed about the laſt period of the rains.

Calcutta, October 1784.

Days.	Thermometer.			Mean denfity at each quarter of the Moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
	M.	N.	E.		M.	N.	E.	M.		N.		E.			Point.	M.	N.	E.	
								d.	m.	d.	m.	d.	m.						
1	83	89	82	FRIDAY.	29.91	22.93	29.93	3		35		10		0.6	SE	0	3	1	Cloudy,
2	81	82	80		.94	.90	.92		10	15		0		0.1	S	1	3	1	ditto,
3	80	85	83		.90	.83	.87		15	15		5			SE	0	1	1	ditto,
4	80	88	84		.83	.77	.86		15	25		15			S	0	2	0	ditto,
5	82	88	84	Laſt Quarter	.78	.78	.78		5	25		15			NE	0	3	0	ditto,
6	81	90	83	692.	.76	.78	.76		0	20		15		0.1	var.	0	1	1	Clear,
7	82	87	82		.74	.77	.77	5		20		15				0	1	1	ditto,
8	82	88	83		.77	.77	.83	5		40		35			W	0	1	0	Cloudy,
9	80	89	82		.83	.87	.86	10		40		35			W	1	1	0	Clear,
10	79	89	82		.88	.87	.86	15		40		35				0	1	0	ditto,
11	99	90	83		30.03	.96	30.	15		40		30				0	1	1	ditto,
12	81	88	85		29.98	.94	29.97		25	25		15				0	2	0	ditto,
13	81	89	85	New Moon	.99	.92	.94		10	25		15				0	1	1	ditto,
14	80	89	84	696.	.93	.89	.82			30		15				1	1	0	ditto,
15	80	87	82		.92	.92	.91		10	40		20				0	1	0	ditto,
16	79	89	83		.91	.93	.23		10	35		30			SW	0	1	0	ditto,
17	78	88	83		.94	30.	.94		0	55		30			SW	0	1	0	ditto,
18	80	87	83		.94	22.97	.96		0	35		30			W	0	1	0	ditto,
19	80	89	83		30.02	.98	30.01		0	40		25			NW	0	1	0	ditto,
20	77	88	82		.04	.98	29.98	10		45		30				0	1	0	ditto,
21	78	88	82	Firſt Quarter	29.98	.96	.99	20		50		45				0	1	0	ditto,
22	78	87	83	702.	30.	.99	.98	30		50		40				0	1	0	Cloudy,
23	77	80	76		29.95	.94	.93	10		0			30	0.05		1	2	1	ditto,
24	75	77	76		.88	.89	.92		40		25		25		N	3	3	0	ditto,
25	74	84	79		.92	.88	.93		35	5			5		NW	1	1	0	ditto,
26	76	86	80		.93	.90	.92		20	15		10				1	1	0	ditto,
27	76	86	80		.92	.89	.94		5	30		20				1	1	1	ditto,
28	75	86	80	Full Moon	.94	.94	.99		0	40		35				1	1	0	Clear,
29	76	83	80	705.	.99	30.	.99	10		35		30				0	1	0	ditto,
30	75	85	80		.98	29.95	30.	10		40		40				0	2	0	ditto,
31	75	85	80		30.	20.	30.02	20		45		40				0	1	0	ditto,
mean	79	91⅓	83½		29.29	2991.	29.92	5	7	30	1	22	2	0.8	WNW	⅓	1½	¼	Clear.

A General State of the Weather for October.

		M.	N.	E.	
Thermometer,	Greatest altitude, —	83°	90°	85°	
	Least ditto, — —	74	77	76	82½ Mean temperature.
	Mean ditto, — —	79	86½	82½	
Barometer,	Greatest ditto, in. —	30.04	30 00	30.02	Mean state of the atmosphere—29.91.
	Least ditto, — —	29.74	29.77	29.76	
	Mean ditto, — —	29.92	29.91	29.92	
	Greatest variation, —	0.30	0.23	0.26	
	Mean density — —	.697	.686	.693	.692 density.
Hygrometer,	Greatest moisture, —	48	.25	30	
	Ditto drought, — —	30	50	43	
	Mean moist and drought, —	5d 7m	30d 1m	22d 2m	

Clear, —	19 day.
Cloudy, —	12 do.
Rain, —	3 do.
Quantity of ditto, —	0-8 inches.

The air very clear and elastic, and heavy dews at night. The Barometer very high, and the wind W and NW.

About the middle of the month the morning became a little foggy, which indicates the approach or beginning of the cold season: the atmosphere thin and dry, and cleared of its vapours; of course the mercury rose in the Barometer.

As the difference between the day and the night-heat begins now to be greater than in any of the eight preceding months, the fogs we have at this season of the year are by that means formed.

Calcutta, November 1784.

Days.	Thermometer.			Mean density at each quarter of the moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
	M.	N.	E.		M.	N.	E.	M. d.	M. m.	N. d.	N. m.	E. d.	E. m.		Points.	M.	N.	E.	
1	74	85	80	MONDAY.	30.02	29.09	30.03	20	1	45		35			NW	0	1	0	Clear,
2	77	85	80		.05	.96	.00	15		40		30				0	1	0	Cloudy,
3	77	86	80		.00	.98	.02	10		40		30				0	1	0	Clear,
4	76	85	80		.02	30.00	.03	0		35		35				0	2	0	Cloudy,
5	78	85	79	Last Quarter 7·5.	.00	29.97	.00	5		40		35				0	1	0	Clear,
6	76	84	80		.00	30.00	.02	0		40		35				0	2	0	ditto,
7	76	86	79		.02	.02	.02	20		45		45				1	2	0	ditto,
8	73	82	78		.02	.02	.00	35		50		50				0	1	1	ditto,
9	72	83	76		.01	.02	.06	45		55		50				0	1	0	ditto,
10	72	81	78		.10	.08	.08	35		50		45				1	1	0	ditto,
11	74	76	76	New Moon 707.	.12	.05	.07	15		0		35			N	1	1	0	Cloudy,
12	75	79	76		.07	.04	.05		40		15		15	0.9	NE	0	2	0	ditto,
13	71	81	77		.05	29.98	.02		40	30			15		N	0	1	0	Clear,
14	77	79	75		29.60	.89	29.92		10	25		20				0	1	0	ditto,
15	74	80	75		.94	.95	30.00		20	25		15			NE	1	1	0	ditto,
16	73	81	73		30.01	30.05	.07		20	40		15				0	1	0	ditto,
17	66	80	72		.07	.03	.06		0	50		35			N	0	1	0	ditto,
18	67	78	74		.04	.02	.04	15		45		40			NE	1	2	1	ditto,
19	68	78	72	First Quarter 716.	.03	29.99	.04	10		45		40			NW	0	1	1	ditto,
20	69	78	75		.03	30.02	.05	15		40		35			N	1	1	0	ditto,
21	69	79	74		.02	29.97	.02	5		40		35			NW	0	1	0	ditto,
22	68	78	73		29.98	.93	29.97	0		40		30				0	1	0	ditto,
23	69	78	72		.97	.92	.94	0	5	35		15				0	0	0	Hazy,
24	70	78	73		.90	.88	.95		35	5			5		N	1	1	0	Clear,
25	68	78	71		.92	.96	30.02		35		5				NW	1	1	0	Cloudy,
26	67	79	73	Full Moon. 717.	30.03	30.03	.04		40	20		20				0	2	0	ditto,
27	67	79	73		.00	.00	.03	20		35		30				0	1	0	Clear,
28	69	80	75		00	00	.03	10		35		30				1	1	0	ditto,
29	67	80	73		.02	29.99	.04	15		45		20			N	0	1	1	ditto,
30	67	80	73		.05	30.04	.08	20		50		30			NW	1	2	1	ditto,
mean	71½	80⅓	75½		30.00	29.99	30.02	10	8	35	⅛	28	1	0.9	NW	½	1⅓	⅛	Clear.

A General State of the Weather for November.

		M.	N.	E.	
Thermometer,	Greateſt altitude, —	78°	86°	80°	
	Leaſt ditto, — —	66	76	71	76 Mean temperature.
	Mean ditto, — —	71½	80⅔	75½	
Barometer,	Greateſt ditto, in. —	30.12	30 05	30.08	
	Leaſt ditto, — —	29.60	29 88	29.92	Mean ſtate of the atmoſphere—30.00.
	Mean ditto, — —	300.0	29.99	30.02	
	Greateſt variation, —	00.52	00.17	00.16	
	Mean denſity — —	.712	.696	.706	.702 denſity.
Hygrometer,	Greateſt moiſture, —	40	15	15	
	Ditto drought, — —	45	55	50	
	Mean moiſt and drought, —	8m 10d	½m 35d	1m 28d	

Clear, — 23 days.
Cloudy, — 7 do.
Rain, — 1 do.
Quantity of do. — 0-9 inches.

The NW winds prevailed this month; but nothing remarkable in the change of the atmoſphere, although there were ſeveral appearances of rain in the courſe of it. The air more elaſtic than any of the former months, alſo more ſerene and dry. The foggy mornings ſtill kept off.

In clear dry weather there is always a very ſenſible change on the Barometer two or three hours after ſun-riſing; it being often near one-tenth of an inch higher about nine o'clock than at ſix, or ſun-riſe. May not this be owing to the load of vapour condenſed and kept near the ſurface of the earth from the coldneſs of the night, which, as it is gradually rarefied by the heat of the ſun, muſt increaſe the weight and ſpring of the atmoſphere, and produce this variation? From hence, the Barometer is always higher in the evening before theſe watery particles fall than in the morning when the air is replete.

Calcutta, December 1784.

Days.	Thermometer.			Mean denfity of each quarter of the Moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
								M.		N.		E.							
	M.	N.	E.		M.	N.	E.	d.	m.	d	m.	d.	m.		Point.	M.	N.	E.	
1	65	79	72		30.07	30.10	30.10	20		45		30		0.05	NE	1	1	1	Cloudy,
2	68	76	72		.07	.04	.07	40		50		30				1	1	0	ditto,
3	69	78	72		.03	.01	.06	20		40		20				0	1	0	ditto,
4	67	78	73	Laft Quarter 721.	.06	.05	.09	15		30		15			NW	1	2	1	ditto,
5	65	79	72		.10	.08	.09	0		45		25				1	2	0	Clear,
6	65	75	70		.08	.05	.10	30		50		45				2	3	0	ditto,
7	63	75	68		.08	.03	.05	45		55		45				1	2	1	ditto,
8	61	74	68		.07	.04	.09	40		55		45				2	1	0	ditto,
9	61	75	69		.08	.06	.07	30		55		45				2	1	0	ditto,
10	62	75	68		.08	.06	.07	30		55		40				1	1	0	ditto,
11	61	75	68		.07	.04	.08	30		55		45				1	1	1	ditto,
12	62	73	68	New Moon 728.	.09	.03	.08	20		40		35				1	0	0	ditto,
13	62	74	69		.08	.04	.05	10		40		40				0	1	0	ditto,
14	64	71	69		.05	.01	.04	20		35		25			N	0	0	0	Cloudy,
15	66	73	68		.04	.07	.08	20		40		35			NNE	1	1	0	ditto,
16	64	75	70		.09	.06	.03	30		45		40			NW	0	1	0	Clear,
17	67	75	70		.07	.01	.02	30		40		30				0	1	0	ditto,
18	66	76	72		.02	.09	.07	10		40		25			NE	0	2	0	ditto,
19	67	75	71	Firft Quarter 725.	.06	.06	.07	0		50		20			W	0	1	0	ditto,
20	66	75	66		.06	.05	.08	25		55		45			NW	0	1	0	ditto,
21	65	74	67		.11	.10	.13	35		60		50				0	1	0	ditto,
22	61	71	65		.17	.13	.17	45		50		50				0	2	0	ditto,
23	58	71	65		.17	.12	.14	35		45		40				1	1	0	ditto,
24	60	72	66		.14	.13	.14	10		50		92				1	1	0	ditto,
25	60	72	68		.15	.14	.16	15		45		45				0	1	0	ditto,
26	61	73	68	Full Moon 732.	.17	.14	.14	5		45		35				1	2	0	ditto,
27	61	73	68		.15	.13	.14	15		50		40				1	2	0	ditto,
28	60	72	67		.14	.10	.13	20		55		40				1	1	0	ditto,
29	60	70	65		.10	.10	.10	30		55		45				1	1	0	ditto,
30	60	69	65		.10	.06	.07	40		55		45			W	0	1	0	ditto,
31	60	68	65		.08	.05	.06	40		55		45			NW	0	1	1	ditto,
mean	63½	74	68½		30.09	30.07	30.09	24		48		38		0.05		⅔	1½	1/10	

A General State of the Weather for December.

		M.	N.	E.	
Thermometer,	Greateſt altitude, —	69°	79°	73°	68 2-3ds Mean heat.
	Leaſt ditto, — —	58	68	65	
	Mean ditto, — —	63½	74	68½	
Barometer,	Greateſt ditto, — —	30.17	30.17	30 14	30°.0'8 Mean ſtate of the atmoſphere.
	Leaſt ditto, — —	30.02	30.02	30 00	
	Mean ditto, — —	30.09	50.09	30.07	
	Greateſt variation, —	00.15	00.15	00.14	
	Mean denſity, — —	.727	.709	.721	.717 M. D.
Hygrometer,	Mean moiſt and drought, —	24 d.	48 d.	38 d.	

Clear, — 26 days.
Cloudy, — 5 do.
Rain, — 1 do.
Quantity of do. — 0.05 inch.

The winds were conſtantly NW, except a few days, when it was inclined a little to the E, which always brings on cloudy thick weather. The whole month remarkably dry, and the atmoſphere of ſuch a denſity as greatly to exceed any of the former. At this ſeaſon of the year there is generally a thick diſagreeable fog in the mornings and evenings: however, this month, on the contrary, has been very clear and ſerene, and but ſeldom thick fogs at either of theſe times.

Calcutta, January 1785.

Days.	Thermometer. M.	Thermometer. N.	Thermometer. E.	Mean density at each quarter of the Moon.	Barometer. M.	Barometer. N.	Barometer. E.	Hygrometer. M. d.	Hygrometer. M. m.	Hygrometer. N. d.	Hygrometer. N. m.	Hygrometer. E. d.	Hygrometer. E. m.	Rain.	Wind and Force. Point.	Wind and Force. M.	Wind and Force. N.	Wind and Force. E.	
1	60	69	64		30.09	30.09	30.09	30		50		45			WN	0	1	0	Clear,
2	57	69	64		.09	.09	.11	40		50		45			NW	0	1	0	ditto,
3	60	71	65		.11	.06	.17	25		45		40				0	1	0	ditto,
4	59	69	65	Last Quarter 732.	.04	.04	.09	30		50		40			WNW	0	1	0	ditto,
5	63	70	66		.10	.08	.08	35		50		40				0	2	0	ditto,
6	64	70	66		.07	.08	.12	30		50		40			W	0	2	0	ditto,
7	63	72	67		.13	.13	.17	35		55		50			NW	0	2	0	ditto,
8	59	72	67		.14	.13	.10	35		60		50			N	1	2	0	ditto,
9	58	73	65		.10	.09	.09	35		60		45			NW	1	2	0	ditto,
10	60	70	65		.10	.10	.14	40		60		50				0	1	0	d tto,
11	58	72	65	New Moon 736.	.13	.10	.12	35		60		50				1	2	1	ditto,
12	59	72	64		.11	.11	.11	25		50		45			N	1	2	0	ditto,
13	60	72	60		.11	.11	.12	30		50		45			NW	2	1	0	ditto,
14	60	73	67		.12	.11	.13	40		45		45				0	1	0	ditto,
15	58	71	65		.14	.14	.14	35		50		50				1	2	0	ditto,
16	60	70	65		.15	.15	.17	40		55		50				0	1	0	ditto,
17	60	69	65	First Quarter 736.	.17	.13	.10	45		55		50			N	1	1	0	ditto,
18	59	70	65		.10	.10	.06	40		55		50			NW	1	2	0	ditto,
19	60	70	65		.08	.05	.05	40		60		50				0	2	0	ditto,
20	58	71	65		.05	.05	.05	30		55		50				0	1	0	ditto,
21	64	74	67		.02	.00	.07	0		40		30			SW	0	1	0	ditto,
22	60	71	65		.08	.05	.08	40		55		50			W	1	2	0	ditto,
23	59	70	65		.04	.04	.05	40		60		55			SW	1	2	0	ditto,
24	62	70	66		.06	.04	.05	40		55		50			W	0	2	0	ditto,
25	62	75	68	Full Moon 728.	.08	.06	.07	40		55		45				0	1	0	ditto,
26	63	74	69		.07	.01	.03	30		45		30			SW	0	2	0	ditto,
27	68	74	70		29.98	29.97	.03		15	40		30			S	0	2	0	ditto,
28	67	76	69		30.01	.98	.04	10		55			10		SW	1	2	0	ditto,
29	65	77	74		.02	30.01	.05	40		60		50			S	0	3	0	ditto,
30	66	76	71		.00	.01	.03	10		40			10			0	3	1	Cloudy,
31	70	78	74		.02	.03	.05		40	0			10			0	3	2	ditto,
mean	61⅓	72	66[illegible]		30.08	30.07	30.09	30	1¼	50		40	1		var.	½	2	½	Clear.

A General State of the Weather for January 1785.

		M.	N.	E.	
Thermometer,	Greateſt altitude, —	70°	78°	74°	M. h. 66.
	Leaſt ditto, — —	57	09	64	
	Mean ditto, — —	61	72	66⅔	
Barometer,	Greateſt ditto, — —	30.17	30.14	30 17	30.08 Mean ſtate of the atmoſphere.
	Leaſt ditto, — —	29.98	29.97	30.03	
	Mean ditto, — —	30.08	30.07	30.09	
	Greateſt variation, —	00.19	00.17	00.14	
	Mean denſity, — —	.732	.712	.723	.722. M. D.
Hygrometer,	Moiſture and drought, —	30 d.	50 d.	40 d.	

Clear, — 29 days.
Cloudy, — 2 do.

The atmoſphere very dry and elaſtic.

The winds variable; but from the middle of the month were almoſt conſtantly from the SW and S, and often pretty ſtrong.

The mercury in the Barometer ſtood very high till about the end of the month, when a very ſenſible change took place, both with regard to the warmth and ſerenity of the weather. Frequent heavy dews about the ſame time.

The mornings always very foggy.

The medium heat of the ſun at mid-day (the inſtrument being expoſed five minutes) was 90°.

Calcutta, February 1785.

Days.	Thermometer.			Mean density of each quarter of the Moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
								M.		N.		E.							
	M.	N.	E.		M.	N.	E.	d.	m.	d.	m.	d.	m.		Point.	M.	N.	E.	
1	71	77	74		30.00	29.90	29.95		50	0	0		40	0.5	S	1	4	1	Cloudy,
2	73	76	71		29.89	.89	.96		40		15		20		SE	1	2	1	ditto,
3	69	77	73	Last Quarter 714.	.96	.96	30.03		30	25		20				0	1	0	Clear,
4	72	68	74		30.08	30.07	.12		3		5		30		S	0	1	0	Cloudy,
5	72	79	75		.08	.04	.04		4	15			25			0	1	1	Clear,
6	74	80	76		29.98	.03	.05		50	30			20			3	2	1	Cloudy,
7	72	80	72		.98	29.99	.04		45	35		0	0		SE	1	1	1	Clear,
8	75	80	73		30.05	30.04	.11		30		15		5	0.8	E	0	1	0	ditto,
9	68	78	74	New Moon 711.	.07	.03	.03		35		15		5		W	1	1	0	Cloudy,
10	72	80	75		29.97	29.99	29.98		15	40		30			N	2	1	0	Clear,
11	70	80	74		.98	.99	30.03	10		60		55				1	1	0	ditto,
12	73	82	69		30.03	30.03	.12	30		50		40		1.1	NW	0	0	3	Cloudy,
13	69	79	72		.05	.00	.06	25		45		40				1	0	2	ditto,
14	69	81	74		.01	.00	.04	35		55		50			SW	1	1	0	Clear,
15	70	81	75		.04	.01	.04	30		45		45				0	1	0	ditto,
16	70	75	73	First Quarter 710.	.07	.06	.08	35		55		50				3	3	0	Cloudy,
17	69	80	73		.06	.02	.05	40		60		55			NW	0	1	1	Clear,
18	70	73	69		.02	.02	.04	35	15	30			5	0.7	SW	0	2	1	Cloudy
19	67	75	71		.03	.04	.03		10			15				0	2	1	ditto,
20	69	79	72		.03	.03	.03			25		20			NW	0	2	0	Clear,
21	69	77	73		.04	.04	.04	0		20		25			W	0	2	1	ditto,
22	70	82	75		29.98	29.97	29.97		10			15				0	1	1	ditto,
23	74	84	76		.99	.96	30.00		20	35		45				1	2	1	ditto,
24	72	82	75	Full Moon 710.	30.00	.98	29.98	35		55		45				0	1	0	ditto,
25	72	86	76		29.96	.96	.97	30		60		55			NW	0	1	0	Cloudy,
26	73	81	76		.96	.96	30.00	50		60		55			NW	1	1	0	Clear,
27	73	83	74		30.03	30.03	.10	50		60		55				0	1	0	ditto,
28	70	81	73		.14	.17	.15	50		60		55				0	1	0	ditto,
mean	71	79½	74		30.02	30.01	30.04	15	15	30	2	28	6	2.9		½	1⅓	½	

A General State of the Weather for February 1785.

		M.	N.	E.	
Thermometer,	Greateſt altitude, —	74°	86°	76°	75 Mean temperature.
	Leaſt ditto, — —	68	75	69	
	Mean ditto, — —	71	79½	74	
Barometer,	Greateſt ditto, — —	30.14	30.17	30.15	30.02 Mean ſtate of the atmoſphere.
	Leaſt ditto, — —	29.89	29.89	29.96	
	Mean ditto, — —	30.02	30.01	30.04	
	Greateſt variation, —	0.25	0.28	0.19	
	Mean denſity, — —	.713	.698	.708	.706.
Hygrometer,	Moiſture and drought, —	0	28 d.	22 d.	

Clear, — 17 days.
Cloudy, — 11 do.
Rain, — 4 do.
Quantity of do. — 2-9 inches.

Thunder five times. Mean heat of the ſun at mid-day, the Thermometer being expoſed five minutes, 96°.

The beginning of this month the air was very moiſt, which is generally the caſe when the wind comes from the S and SE.

On the contrary, the NW winds which prevailed renders it very dry and elaſtic, and has always a very great effect in raiſing the mercury in the barometer. During the whole of this month the mornings were extremely thick and foggy: on the 1ſt, 8th, and 12th, moderate ſtorms from the NW.

Calcutta, March 1785.

Days.	Thermometer.			Mean denfity of each quarter of the Moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
								M.		N.		E.							
	M.	N.	E.		M.	N.	E.	d.	m.	d.	m.	d.	m.		Point.	M.	N.	E.	
1	68	84	73		30.12	30.10	30.13	55		60		60			NW	1	2	0	Clear,
2	68	84	73		.10	.07	.03	50		60		55				0	1	0	ditto,
3	69	80	74		.05	.04	.07	50		55		50			SW	0	2	1	ditto,
4	72	82	75	L. Q. 713.	.04	.03	.06	25		50		50				1	2	2	ditto,
5	73	83	75		.05	.04	.04		5	35		25			SE	0	3	1	ditto,
6	73	81	76		.03	29.98	.00		5	50		35				0	4	1	ditto,
7	73	82	77		29.97	.99	.04		0	55		40			S	0	4	1	ditto,
8	73	82	77		30.02	30.03	.07	20		45		40			SE	0	3	2	Cloudy,
9	73	87	77		.06	.04	.07	40		55		40			SW	1	2	0	Clear,
10	74	84	74		.05	.02	.05	25		50		45		0.1	SW	0	3	1	Cloudy,
11	71	83	76	N. M. 709.	.02	29.98	.02	45		50		40			SE	0	2	1	Clear,
12	74	85	77		29.98	.90	29.93	10		40		15				0	2	1	Cloudy,
13	75	84	75		.90	.84	.89			20		40		0.3		1	3	2	Clear,
14	71	84	74		.90	.88	.93			30		15		fome hail.		0	3	1	Cloudy,
15	75	84	74		.90	.85	.93	35		40		20				1	4	3	ditto,
16	73	83	77		.87	.87	.97		20	20		0				3	4	4	ditto,
17	77	85	80		.90	.89	.97	10	10	25		0			S	1	1	1	ditto,
18	77	86	80	F. Q. 702.	.96	.88	.93		20	21			10		SW	0	2	1	Clear,
19	77	89	82		.92	.87	.92		25	50		10			SE	1	2	1	ditto,
20	78	90	83		.89	.85	.88		35	40		10			SW	0	2	2	ditto,
21	78	87	81		.86	.84	.87		20	20			10		SE	1	3	1	Cloudy,
22	79	86	81		.87	.87	.89		30	10			10		S	1	4	2	ditto,
23	79	85	81		.85	.84	.89		30	10				0.1		1	3	4	Clear,
24	77	85	80		.87	.85	.89		10	20						1	2	3	ditto,
25	78	87	81		.89	.92	.98		30	35						0	3	2	ditto,
26	79	86	81	F. M. 696.	.86	.91	.91		30	20			10			0	3	3	Cloudy,
27	79	88	82		.89	.93	.86		20	20						2	3	1	Clear,
28	79	88	82		.85	.87	.92		35	15			5			1	2	3	ditto,
29	79	88	83		.90	.87	.92		25	20			5			1	2	2	ditto,
30	80	84	82		.95	.87	.90		30	20			20			0	0	0	Cloudy,
31	79	88	82		.90	.85	.90	25		60		40				0	1	0	Clear,
mean	75	85	78		29.95	29.92	29.67	13	13	36		20	8	0.5	S	½	3	2	Clear.

A General State of the Weather for March 1785.

		M.	N.	E.	
Thermometer,	Greateſt altitude, —	80°	90°	83°	79°.
	Leaſt ditto, — —	68	80	73	
	Mean ditto, — —	75	85	78	
Barometer,	Greateſt ditto, — —	30 12	30.10	30 13	29.95.
	Leaſt ditto, — —	29.85	29.84	29 86	
	Mean ditto, — —	29.95	29.92	29.97	
	Greateſt variation, —	.27	26	.27	.698.
	Mean denſity, — —	.075	.688	.700	
Hygrometer,	Moiſture and drought, —	0.0	36 d.	18 d.	

Clear,	—	20 days.
Cloudy,	—	11 do.
Rain,	—	3 do.
Quantity of do.	—	0-5 inch.

Thunder five times. Mean heat of the ſun 100°.

There were two or three thunder-ſtorms this month ; but gentle, and attended with little rain. Several mornings about the beginning were very foggy and damp, and continued ſo ; but in a leſſer degree nearly throughout the month. Heavy dews from the 15th.

The barometer continued low, which may proceed from the high winds that prevailed, as well as from the extreme rarefaction of the atmoſphere at this ſeaſon of the year. We had often the appearance of rain (as muſt always be the caſe) while the wind comes from the ſouth quarter, and bringing with it ſo much vapour.

Calcutta, March 1785.

Calcutta, *April* 1785.

Days.	Thermometer.			Mean density at each quarter of the moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
								M.		N.		E.							
	M.	N.	E.		M.	N.	E.	d.	m.	d.	m.	d.	m.		Points.	M.	N.	E.	
1	79	84	80		29.90	29.86	29.90	30		55		50			S	0	2	2	Clear,
2	75	90	80		.89	.89	.85	25		60		30				0	1	2	ditto,
3	77	90	83	Last Quarter 697.	.82	.77	.81		20	60		30				1	3	2	ditto,
4	77	90	82		.82	.80	.84		10	45		20				0	1	3	ditto,
5	79	88	83		.83	.80	.83			45		30				0	3	1	ditto,
6	79	90	83		.81	.82	.83			35		25				0	3	3	ditto,
7	78	88	82		.86	.85	.88			20		20				1	4	3	ditto,
8	80	88	81		.88	.83	.84		15	30						0	4	4	Cloudy,
9	80	87	84	New Moon 694.	.82	.81	.84		30	20		10				2	3	2	Clear,
10	80	87	84		.78	.77	.85		30	40			10			1	4	1	Cloudy,
11	81	88	85		.83	.82	.86		25	50		15				1	2	3	ditto,
12	81	88	85		.82	.80	.87		30		10	35				1	0	1	ditto,
13	81	85	84		.82	.86	.89		25	30		35				1	0	0	ditto,
14	83	84	82		.87	.87	.89		10	40		40				1	4	0	ditto,
15	81	84	83		.90	.92	.97	20		30					NW	1	0	1	ditto,
16	78	81	74	First Quarter 698.	.97	.92	.96	45			40		0	2.4		3	2	4	ditto,
17	69	75	75		.86	.79	.83		30		20		50	3.6	NE	3	3	2	ditto,
18	77	82	80		.82	.88	.94		60	15			20	0.5	S	0	0	0	ditto,
19	79	84	82		.92	.84	90		40							0	4	0	Clear,
20	78	85	81		.85	.79	.93		20							1	2	2	Cloudy,
21	75	84	80		.85	.83	.90		10							1	3	2	Clear,
22	74	82	80		.85	.84	.87		20		10		10	0.9		1	2	0	Cloudy,
23	79	85	83		.83	.80	.83		40		10		20		SE	1	2	1	Clear,
24	81	88	85	Full Moon. 694.	.80	.75	.78		40	10			20			1	3	1	Cloudy,
25	82	89	85		.77	.76	.84		40	20			10	0.3		1	2	1	Clear,
26	83	89	81		.76	.77	.87		30		10		10	0.3	S	1	4	4	ditto,
27	82	89	82		.72	.68	.83		40		20		20			3	4	4	Cloudy,
28	79	87	83		.70	.75	.74		40	20			30			1	3	3	ditto,
29	82	90	85		.76	.79	.84		50	10			15			0	3	1	ditto,
30	82	91	85		.82	.83	.84		40	10			15			1	3	1	ditto,
mean	79	86½	82		29.83	29.81	29.86	4	24	24	4	12	8	8.0	S	1	3	2	Cloudy.

A General State of the Weather for April 1785.

		M.	N.	E.	
Thermometer,	Greateſt altitude, —	83°	91°	85°	82½.
	Leaſt ditto, — —	69	75	74	
	Mean ditto, — —	79	86½	82	
Barometer,	Greateſt ditto, — —	29.97	29.92	29.97	69.83.
	Leaſt ditto, — —	29.70	29.68	29.74	
	Mean ditto, — —	29.83	29.81	29.86	
	Greateſt variation, —	.27	.24	.23	.690.
	Mean denſity, — —	.695	.684	.691	
Hygrometer,	Moiſture and drought, —	20 m.	20 d.	4 d.	

Clear,	—	17 days.
Cloudy,	—	13 do.
Rain,	—	6 times.
Quantity of do.	—	8 inch.

The quantity of rain that fell on the ſixteenth and ſeventeenth was very conſiderable; and the variation that appeared on the mercury before and after the thunder-ſtorms was very great, ſometimes 00′.30 in the ſpace of a few minutes.

Thunder ſix times. Mean heat of the ſun 108° to 110°.

The temperature of the air throughout this month was leſs warm and ſultry than it is generally found at this time of the year; as alſo, the ſtorms that came from the NW were fewer in number. The air rather moiſt, and little or no variation in the winds, they being always directly S and SE.

Calcutta, April 1785.

Calcutta, May 1785.

Days.	Thermometer.			Mean density of each quarter of the Moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
	M.	N.	E.		M.	N.	E.	M. d.	M. m.	N. d	N. m.	E. d.	E. m.		Point.	M.	N.	E.	
1	82	92	86		29.82	29.80	29.81		40	10			10		S	1	2	1	Clear,
2	83	91	85		.77	.74	.75		30	10			10			2	2	2	ditto,
3	83	91	87	Last Quarter 688.	.75	.68	.75		30	20		20				1	1	2	ditto,
4	87	91	86		.76	.78	.83	15		40		20				6	3	1	ditto,
5	85	89	86		.78	.83	.87	0		30		20				1	4	4	Cloudy,
6	83	90	83		.96	.86	30.03	15		30		20		0.5		2	3	2	Clear,
7	81	87	84		.78	.78	29.94	10		35		30			E	1	2	1	Cloudy,
8	82	90	87	New Moon 690.	.95	.92	.97		10	50		30			S	0	2	0	Clear,
9	83	90	85		.94	.89	.95		10	50		25				0	2	1	ditto,
10	83	89	85		.92	.85	.89	10		45		20		0.3	SE	0	2	0	ditto,
11	84	90	83		.86	.79	.83	10		50		30				0	2	2	ditto,
12	83	90	83		.80	.77	.85			50		15		0.1		0	2	2	ditto,
13	84	89	85		.80	.78	.83		10	45		35				3	3	0	ditto,
14	84	91	85		.83	.77	.82	25		50		30				0	1	0	Cloudy,
15	84	92	86		.84	.77	.80		10	60.		55				0	1	0	Clear,
16	86	93	84	First Quarter 688.	.81	.76	.86	40		60'		55			SW	0	0	0	ditto,
17	82	92	85		.83	.81	.90	20		56		30				0	1	0	Cloudy,
18	80	88	84		.77	.86	.93		10	40		20		1.4	S	0	1	0	ditto,
19	81	88	86		.89	.81	.83	10		50		40			SW	1	0	0	Clear,
20	83	89	86		.8[illegible]	.72	.79	10		50		40			S	0	0	0	Cloudy,
21	84	91	83		.75	.67	.79	10		55		40				0	1	1	Clear,
22	82	90	87		.74	.65	.75	30		40		40				0	1	0	Cloudy,
23	83	91	89		.69	.58	.66	10		40		35			SE	0	1	0	Clear,
24	87	94	89	Full Moon 685.	.63	.53	.66	20		20		20		0.2	S	0	0	4	Cloudy,
25	84	92	82		.60	.59	.63		10	60		10		0.3		1	0	0	ditto,
26	79	88	85		.65	.64	.70		10	50		20			SE	1	0	0	ditto,
27	84	90	80		.65	.64	.76		20	40			10	0.5		0	3	1	ditto,
28	82	88	85		.70	.70	.78		20	40			10			0	1	3	Clear,
29	81	88	82		.73	.70	.75	10		40		10		0.4	S	3	3	1	Cloudy,
30	84	90	85		.74	.66	.72		20	0				0.1		3	3	2	Clear,
31	83	87	85		.61	.68	.72		40		20		40	1.2	SW	2	1	1	Cloudy,
mean	83	89⅓	85		29.77	29.74	29.82	8	9	40	1	23	3	6.0		4	2	1	Clear.

A General State of the Weather for May 1785.

		M.	N.	E.	
Thermometer,	Greateſt altitude, —	87°	94°	89°	86°.
	Leaſt ditto, — —	79	87	80	
	Mean ditto, — —	83	89⅔	85	
Barometer,	Greateſt ditto, — —	29.96	89.92	30.03	29.77.
	Leaſt ditto, — —	29.60	29.53	29.63	
	Mean ditto, — —	29.77	29.74	29.82	
	Greateſt variation, —	.36	.39	.30	.682.
	Mean denſity, — —	.685	.676	.685	
Hygrometer,	Mean moiſture, — —	1 m.	30 d.	20 d.	

Clear,	—	16 days.
Cloudy,	—	13 do.
Rain,	—	10 times.
Quantity of do.	—	6 inch.

Thunder fourteen times. Mean heat of the ſun 110° to 111°.

The air this month has been drier than that of the preceding; but the winds being more from the SE quarter, is the reaſon of the mercury being ſo low: much cloſe and ſultry weather about the middle. The variation on the Barometer much greater than uſual.

Calcutta, June 1785.

Days.	Thermometer.			Mean density at each quarter of the Moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
	M.	N.	E.		M.	N.	E.	M. d.	M. m.	N. d.	N. m.	E. d.	E. m.		Point.	M.	N.	N.	
1	84	90	83		29.61	29.54	29.65		40		10		20	0.2	S			1	Cloudy,
2	83	85	82		.63	.61	.68		40		20		40		SE	1	1		ditto,
3	81	90	83		.68	.67	.70		45		0		20				1	1	Clear,
4	81	85	82		.70	.66	.72		40		40		50	0.7		1			Cloudy,
5	81	86	83		.70	.62	.64		40		30		40		NE	1		1	ditto,
6	81	85	83		.62	.55	.61		60		30		40	0.1	E	1	1	1	ditto,
7	82	85	82	New Moon 687.	.59	.61	.69		50		50		50	0.1		1	1		ditto,
8	82	84	80		.64	.60	.68		60		60		60	0.5	SE	1			ditto,
9	80	80	82		.68	.65	.70		60		60		60	2 7			1	1	ditto,
10	80	84	84		.57	.64	.68		60		40		60	1.5	S		1		Clear,
11	82	84	84		.67	.64	.70		60		20		50	0.1				1	Cloudy,
12	82	87	84		.70	.68	.70		50		10		30				1		Clear,
13	84	87	85		.62	.68	.58		30		10		30				1		ditto,
14	83	87	81		.56	.46	.50		50		30		30	0.2			1		Cloudy,
15	84	84	82	First Quarter 681.	.44	.40	.47		50		50		40	2.9	SE			2	ditto,
16	81	84	80		.48	.49	.57		60		50		50	1.7			1		ditto,
17	82	83	80		.54	.58	.65		60		60		50	1.4	E		1		ditto,
18	79	82	79		.63	.62	.66		60		60		60	2.9	SE		1		ditto,
19	80	82	80		.58	.56	.60		60		40		60	1.3		1	2	1	ditto,
20	80	81	81		.57	.54	.62		60		40		50	0 2		2	1	1	ditto,
21	79	83	82	Full Moon 687.	.57	.54	.60		50		40		40	0.3			1		ditto,
22	81	84	82		.57	.55	.57		40		40		50	N			1	1	ditto,
23	81	82	80		.55	.55	.59		50		30		60	5.9					ditto,
24	80	84	82		.56	.52	.58		50		30		40	0.1		1	1		ditto,
25	82	85	83		.53	.52	.57		50		30		40	N		1	1	2	ditto,
26	81	85	83		.52	.52	.55		50		30		40	0.1		1			ditto,
27	83	85	84	Last Quarter 681.	.47	.48	.54		50		30		40	0.1				1	ditto,
28	82	84	83		.35	.45	.50		50		30		40	0.6		1			ditto,
29	82	85	84		.48	.44	.48		50		30		40				2		ditto,
30	82	85	84		.46	.45	.49		50		30		40	0.8	NE		1		ditto,
mean	81¼	84½	82		29.59	29.56	29.61		50		30		40	24.4		½	¼	½	Cloudy.

A General State of the Weather for June 1785.

		M.	N.	E.	
Thermometer,	Greateſt altitude, —	84°	90°	85°	82⅔
	Leaſt ditto, — —	79	80	79	
	Mean ditto, — —	81½	84½	82	
Barometer,	Greateſt ditto, inches, —	29.70	29.68	29.72	29.58.
	Leaſt ditto, — —	29.44	29.40	29.47	
	Mean ditto, — —	29.59	29.56	29.61	
	Greateſt variation, —	.26	.28	.25	
	Mean denſity, — —	.687	.681	.685	.684.
Hygrometer,	Mean moiſture, — —	50 m.	30 m.	40 m.	

Clear, — 4 days.
Cloudy, — 26 do.
Thunder, — 16 times.
Rain, — 24 do.
Quantity do. — 24·4 inches.

Mean heat of the Sun 106°.

The quantity of rain this month has been uncommonly great: and ſcarce a day has paſſed without ſome falling; the weather of courſe diſagreeable and unhealthy.

The mercury in the Barometer very low, which ſeldom fails to be the caſe while the winds come from the SE and E quarters.

Calcutta, *July* 1785.

Days.	Thermometer. M.	Thermometer. N.	Thermometer. E.	Mean denſity of each quarter of the Moon.	Barometer. M.	Barometer. N.	Barometer. E.	Hygrometer. M. d.	Hygrometer. M. m.	Hygrometer. N. d.	Hygrometer. N. m.	Hygrometer. E. d.	Hygrometer. E. m.	Rain.	Wind and Force. Point.	Wind and Force. M.	Wind and Force. N.	Wind and Force. E.	
1	82	86	85		29.47	29.46	29.52		40		20		40	0.1	SE	0	0	0	Cloudy,
2	80	80	83		.51	.50	.58		40		30		40	0.3	NE	1	1	2	ditto,
3	79	83	81		.52	.53	.57		50		30		50	0.2		1	1	3	ditto,
4	80	84	81		.56	.54	.60		60		40		0	2.6	S	0	1	0	ditto,
5	82	82	81	New Moon 684.	.58	.54	.59		60		50		60	0.3	S	0	0	0	ditto,
6	81	80	80		.54	.45	.47		60		60		60	2.6	SE	0	0	3	ditto,
7	79	83	81		.44	.47	.57		60		60		60	0.1	SW	0	2	2	ditto,
8	80	82	80		.54	.57	.63		60		60		60	0.4	SE	0	1	1	ditto,
9	80	84	81		.60	.59	.66		60		60		60		S	1	1	1	ditto,
10	80	85	83		.66	.63	.70		60		2[illegible]		40			0	1	1	ditto,
11	82	84	82		.68	.66	.70		60		30		40	R		0	0	1	ditto,
12	81	85	83		.66	.57	.58		50		30		40	1.3	SE	0	1	2	ditto,
13	83	83	82	First Quarter 686.	.55	.48	.54		50		40		50	1.7		0	1	0	ditto,
14	81	83	81		.52	.51	.62		50		40		50	0.1	SE	1	1	3	ditto,
15	80	84	83		.63	.63	.68		50		20		30		SW	2	2	2	ditto,
16	82	85	83		.67	.60	.64		50		30		40	0.3	S	2	1	2	ditto,
17	82	86	84		.62	.57	.57		50		20		30	0.2	S	1	1	4	Clear,
18	82	83	81		.52	.49	.50		50		30		40	0.5	SW	1	2	3	Cloudy,
19	80	84	80		.47	.50	.57		50		20		40	0.6	SE	1	0	0	ditto,
20	80	83	82		.55	.54	.60		50		30		40	0.6	SW	0	0	1	ditto,
21	81	84	82	Full Moon 678.	.57	.55	.63		50		30		40		S	0	1	1	ditto,
22	81	83	81		.60	.62	.66		50		40		40	0.1	SE	0	0	0	ditto,
23	80	84	81		.66	.64	.72		50		40		30	0.1		1	1	0	ditto,
24	80	85	83		.72	.67	.73		50		40		20	R		1	2	0	ditto,
25	83	87	85		.73	.67	.69		25		30		10		S	1	1	0	Clear,
26	84	87	84		.72	.67	.72		30		30		10	0.1	SE	0	0	1	ditto,
27	84	86	84		.70	.63	.67		10		10		20		S	0	0	0	Cloudy,
28	81	85	84	Laſt Quarter 734.	.67	.60	.64		30		0		0	0.3	SE	0	2	1	ditto,
29	84	89	87		.64	.58	.66		40		0		20			0	1	0	Clear,
30	84	87	85		.60	.56	.60		40		20		20	0.1		0	1	0	Cloudy,
31	82	86	84		.57	.46	.65		40		10		20	0.1		1	0	1	ditto,
mean	81⅓	84½	8[illegible]		29.59	29.56	29.62		50		35		45	12.8		½	1	1	Cloudy.

A General State of the Weather for July 1785.

		M.	N.	E.	
Thermometer,	Greateft altitude, —	84°	89°	87°	82 2/3
	Leaft ditto, — —	79	80	80	
	Mean ditto, — —	81 1/2	84 1/3	82 1/3	
Barometer,	Greateft ditto, — —	29.73	92.67	29.73	29.59.
	Leaft ditto, — —	29.44	29.45	29.47	
	Mean ditto, — —	29.59	29.56	29.62	
	Greateft variation, —	.29	.22	.26	
	Mean denfity, — —	.686	.681	.686	.684.
Hygrometer,	Mean moifture, — —	50 m.	35 m.	40 m.	

Clear, —	4 days.
Cloudy, —	27 do.
Rain, —	24 times.
Quantity of ditto, —	12-8 inches.
Thunder, — —	11 times.

Mean heat of expofed air 100°.

The weather this, as the preceding month, very relaxing and difagreeable, although the quantity of rain is only about one-half. The low ftate of the mercury is undoubtedly affected by the eafterly winds, as is no lefs the animal fpirits.

Calcutta, August 1785.

Days.	Thermometer.			Mean density at each quarter of the Moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
								M.		N.		E.							
	M.	N.	E.		M.	N.	E.	d.	m.	d.	m.	d.	m.		Point.	M.	N.	E.	
1	80	84	82		29.53	29.50	29.58		50		40		40	0.3	SE	0	1	1	Cloudy,
2	81	86	83		.56	.53	.60		50		30		20			0	1	0	Clear,
3	83	84	83	New Moon 685.	.59	.56	.63		50		20		30			0	1	0	Cloudy,
4	83	87	85		.60	.55	.60		40		20		20	0.1		1	1	0	ditto,
5	81	83	81		.59	.58	.61		40		40		40	1.3		1	1	0	ditto,
6	80	83	81		.56	.54	.60		50		40		50	0.9		1	1	1	ditto,
7	81	84	81		.58	.56	.63		60		40		50	0.2		0	1	0	ditto,
8	80	82	81		.63	.62	.74		60		50		50	1.2		0	1	1	ditto,
9	80	80	80		.74	.74	.76		60		60		50	0.1		0	0	1	ditto,
10	79	84	82		.74	.68	.70		60		50		50			0	1	1	ditto,
11	82	87	85	First Quarter 686.	.65	.59	.62		60		30		50			0	0	1	Clear,
12	82	85	83		.60	.61	.64		50		30		40			0	1	1	Cloudy,
13	81	83	82		.63	.60	.64		50		40		30			0	0	0	ditto,
14	81	85	84		.58	.50	.57		50		30		40	0.3		0	1	1	ditto,
15	83	86	84		.53	.49	.57		50		40		30	0.4		0	1	0	ditto,
16	82	83	82		.54	.53	.57		50		30		20	0.5	NE	1	1	2	ditto,
17	82	84	82		.50	.54	.62		50		20		30	0.2	SE	1	1	1	ditto,
18	83	84	83		.62	.58	.64		50		30		40	1.3		1	1	1	ditto,
19	84	87	85	Full Moon 687.	.60	.58	.63		50		20		30			0	1	2	ditto,
20	80	89	86		.58	.60	.66		40		0		0		NE	0	1	1	Clear,
21	84	85	85		.62	.60	.67		20		20		20		SE	0	1	0	Cloudy,
22	83	87	84		.62	.57	.64		30		10		20	0.2		4	1	1	ditto,
23	83	85	83		.61	.60	.66		40		30		30	0.1		1	1	1	ditto,
24	81	85	82		.63	.63	.70		40		30		30	0.3	NE	1	1	1	ditto,
25	82	85	84		.68	.67	.72		40		30		40			1	1	0	ditto,
26	81	84	81	Last Quarter 690.	.70	.66	.71		40		30		40	0.3		0	0	2	ditto,
27	80	84	81		.71	.70	.78		40		30		30	0.1		0	0	1	ditto,
28	81	85	83		.78	.72	.78		40		20		30	0.1		0	0	1	ditto,
29	81	85	83		.74	.67	.76		30		20		30		SE	0	0	1	ditto,
30	82	84	83		.70	.67	.73		40		20		30	0.1		0	0	0	ditto,
31	82	83	81		.67	.62	.69		30		30		30	1.4		1	1	1	ditto,
mean	81½	84½	82½		29.62	29.53	29.64		50		30		40	9.3	SE	½	1	1	Cloudy.

A General State of the Weather for Auguſt 1785.

			M.	N.	E.	
Thermometer,	Greateſt altitude,	—	84°	89°	86°	82⅔.
	Leaſt ditto,	— —	79	80	80	
	Mean ditto,	— —	81½	84½	82½	
Barometer,	Greateſt ditto,	in. —	29 78	29 72	29.78	29 62.
	Leaſt ditto,	— —	29.50	29 49	2).57	
	Mean ditto,	— —	29.62	29.59	29.64	
	Greateſt variation,	—	.28	.23	.21	
	Mean denſity,	— —	.687	.682	.636	.685.
Hygrometer,	Moiſture,	— —	50 m.	30 m.	40 m.	

Clear,	—	3 days.
Cloudy,	—	28 do
Rain,	—	20 times.
Thunder,	—	16 do.
Quantity of do.	—	9-3 inches.

The heat of the ſun at mid-day 100°.

Much cloudy weather, but ſeldom any very heavy falls of rain, and the quantity altogether but moderate. The river very full; and accounts of heavy rains up the country.

The Barometer remarkably low the whole month: a proof of there being ſtill much water in the clouds.

Calcutta, *September* 1785.

Days.	Thermometer.			Mean denſity at each quarter of the Moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
								M.		N.		E.							
	M.	N.	E.		M.	N.	E.	d.	m.	d.	m.	d.	m.		Point.	M.	N.	N.	
1	80	84	82		29.65	29.64	29.74		40		20		20		NE	2	2	2	Cloudy,
2	80	83	81	New Moon 692.	.70	.69	.77		30		20		30	0.2		1	1	1	ditto,
3	80	85	83		.75	.74	.82		50		20		20			1	1	1	Clear,
4	81	87	85		.77	.73	.80		40		10		20		SE	0	1	0	ditto,
5	82	88	85		.78	.76	.84		30	10		10				0	1	0	ditto,
6	83	89	85		.80	.74	.80		30	20		0	0			0	1	0	ditto,
7	84	88	85		.76	.73	.77		20	20		10				1	0	0	ditto,
8	82	89	85		.77	.73	.80		30	10		10				1	1	0	ditto,
9	84	87	85		.80	.76	.85		20	10		0	0			0	1	0	Cloudy,
10	83	85	83	Firſt Quarter 688.	.83	.82	.87		20		10	0	0			0	1	0	ditto,
11	83	84	82		.82	.77	.80		40		20		30	0.5	E	0	1	0	ditto,
12	82	86	83		.97	.68	.73		40		20		20	0.3		1	0	1	ditto,
13	82	88	83		.68	.63	.70		40		20		20	0.6		0	0	1	ditto,
14	82	84	82		.66	.62	.69		40		20		20		NE	0	1	0	Clear,
15	81	87	83		.64	.60	.68		40		30		20			0	1	0	Cloudy,
16	81	85	83		.66	.64	.72		40		30		20	0.4	E	2	1	0	Clear,
17	81	84	81	Full Moon 688.	.67	.66	.73		50		40		20	0.8	NE	2	1	1	Cloudy,
18	80	83	82		.68	.64	.70		50		40		40	0.3		2	1	2	ditto,
19	81	84	81		.62	.59	.66		50		40		50	0.3	SE	2	1	1	ditto,
20	80	84	80		.62	.60	.70		50		40		50	1.4		1	0	1	ditto,
21	80	82	81		.68	.72	.78		50		40		50	0.5		1	2	2	ditto,
22	80	82	81		.78	.77	.80		50		30		0	0.1		3	2	2	ditto,
23	81	87	85		.78	.72	.74		40		40		20		E	1	1	0	ditto,
24	84	87	85	Laſt Quarter 686.	.72	.66	.70		20		10		10			0	0	0	Clear,
25	83	86	82		.66	.62	.70		20		0		10			0	0	0	Cloudy,
26	81	83	80		.66	.64	.72		20		20		10	1.3	SE	1	2	2	ditto,
27	80	83	81		.66	.63	.68		30		20		20	1.7		1	1	2	ditto,
28	80	81	80		.62	.60	.67		50		50		30	1.6		1	2	2	ditto,
29	80	84	81		.66	.66	.72		50		50		50	3.5		2	2	3	ditto,
30	80	85	83		.70	.73	.78		50		20		20	0.4		0	1	1	ditto,
mean	81	85	82½		29.71	29.68	29.75		45	2	20	1	25	11.7	SE	1	1	1	

A General State of the Weather for September, 1785.

		M.	N.	E.	
Thermometer,	Greateſt altitude, —	84°	89°	85°	$82\frac{2}{3}$
	Leaſt ditto, — —	80	81	80	
	Mean ditto, — —	81	85	$82\frac{1}{2}$	
Barometer,	Greateſt ditto, inches, —	29.83	29.82	29.87	29.71.
	Leaſt ditto, — —	29.62	29.59	29.66	
	Mean ditto, — —	29.71	29.68	29.75	
	Greateſt variation, —	.21	.23	.21	
	Denſity, — —	.687	.682	.688	.686.
Hygrometer,	Moiſture, — —	45 m.	20 m.	25 m.	

Clear,	—	8 days.
Cloudy,	—	22 do.
Thunder,	—	13 times.
Rain,	—	16 do.
Quantity do.	—	11-7 inches.

Mean heat of the ſun at mid-day 110°.

The Barometer higher than the former month: about the middle and end, great quantities of rain. By account from Berhampore, the quantity of rain there muſt have been very conſiderable, and many parts above, the whole country being under water, and the river ſwelling prodigiouſly. This month very unhealthy and many people dying.

Calcutta, October 1785.

Days.	Thermometer.			Mean density at each quarter of the Moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
								M.		N.		E.							
	M.	N.	E.		M.	N.	E.	d.	m.	d.	m.	d.	m.		Point.	M.	N.	E.	
1	83	87	84		29.84	30.80	29.85		30	20		10			NE	0	0	0	Clear,
2	81	85	83		.83	.82	.85		10	40		30				0	0	0	ditto,
3	83	87	85		.83	.81	.86	10		30		10				0	0	0	ditto,
4	82	87	84	N. M. 691.	.85	.85	.90	10		40		10				0	0	1	ditto,
5	82	87	84		.88	.86	.93		0	30		0				0	0	0	ditto,
6	84	88	85		.95	.88	.92		10	10		0				0	0	0	ditto,
7	83	87	85		.90	.82	.90		0	10		0				0	0	1	ditto,
8	82	85	81		.88	.82	.90		0	10		0	10	0.1		1	1	1	Cloudy,
9	81	82	80		.88	.85	.91		10	0			10	0.6		1	2	2	ditto,
10	78	84	81		.91	.88	.96		10	30						1	1	1	ditto,
11	81	85	83	F. Q. 665.	.96	.90	.94		10	20		10		0.1		0	1	0	Clear,
12	83	87	82		.94	.90	.96		0	30		10			NW	0	1	1	ditto,
13	82	87	85		.95	.90	.96		0	40		20				0	1	0	ditto,
14	83	88	85		.95	.89	.93	10		40		10				0	1	1	ditto,
15	84	88	84		.93	.91	.98		0	40		20				0	1	0	ditto,
16	83	85	85		.98	.93	.96		0	10		0				0	1	1	ditto,
17	83	87	84	F. M. 693.	.97	.92	.93		10	40		10				1	1	0	ditto,
18	81	88	85		.93	.89	.93		0	30		20				1	1	0	ditto,
19	82	83	83		.92	.96	.94		0	30		20				0	1	1	ditto,
20	81	85	83		.90	.84	.96	10		50		30				1	1	1	ditto,
21	81	86	83		.90	.88	.91	20		50		30				0	1	0	ditto,
22	79	87	82		.92	.84	.89	10		50		20				0	1	1	ditto,
23	79	86	82		.91	.87	.93	10		50		30				0	1	0	ditto,
24	80	85	83		.92	.90	.95	20		40		20				1	0	0	ditto,
25	79	86	84	L. Q. 698.	.94	.90	.94		.0	30		20	10			0	1	0	ditto,
26	79	83	79		.90	.88	.90		0	20			20	0.2	SW	0	2	2	Cloudy,
27	79	82	80		.86	.82	.88		30		10		20	R	NE	0	2	1	ditto,
28	78	82	79		.87	.84	.88		30		0		10			0	2	1	ditto,
29	77	82	79		.85	.82	.92		30		10		10			0	2	2	ditto,
30	78	82	79		.90	.86	.92		30		10		10	0.3	NW	0	1	0	ditto,
31	87	82	80		.92	.90	.95		30				10	0.1	NE	0	0	0	ditto,
mean	[illegible]	85½	82 [illegible]		29.90	29.87	29.96	3	8	25	1	10	3	1.4	NW	[illegible]	1	[illegible]	Clear.

A General State of the Weather for October 1785.

		M.	N.	E.	
Thermometer,	Greateſt altitude, —	84°	88°	85°	83.
	Leaſt ditto, — —	77	82	79	
	Mean ditto, — —	81	$85\frac{1}{2}$	82	
Barometer,	Greateſt ditto, — —	29.98	29.96	29.98	29.91.
	Leaſt ditto, — —	29.83	29.81	29.85	
	Mean ditto, — —	29.90	29.87	29.96	
	Greateſt variation, —	.15	.15	.13	
	Mean denſity, — —	.694	.684	.692	.691.
Hygrometer,	— — —	5 d.	24 d.	7 d.	

Clear, — 21 days.
Cloudy, — 10 do.
Rain, — 7 times.
Thunder, — — 4 do.
Quantity of ditto, — 1-4 inches.

The mean heat of the ſun at mid-day 110°.

The wind began to ſet in from the NW about the 12th and 13th.

Calcutta, October 1785.

Calcutta, November 1785.

Days.	Thermometer.			Mean density at each quarter of the Moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
								M.		N.		E.							
	M.	N.	E.		M.	N.	E.	d.	m.	d.	m.	d.	m.		Point.	M.	N.	E.	
1	79	85	82		29.93	29.90	29.96		20	10			10		NW	0	2	0	Clear,
2	80	85	82	N. M. 6,6.	.95	.93	30.00		20	10			10		NE	0	2	0	ditto,
3	80	84	80		.93	.97	29.96		20	20				R	NE	0	2	0	ditto,
4	79	81	79		.94	.87	.92		20				10			1	1	2	ditto,
5	77	81	79		.90	.82	.87		20				20	R		2	2	1	ditto,
6	79	82	79		.88	.85	.80		30				10			0	2	0	ditto,
7	78	81	80		.93	.90	.97		30		30			0.4		0	1	1	Cloudy,
8	77	77	75		.93	.90	.93		30		30		30			2	2	3	ditto,
9	73	76	74	F. Q. 706.	.90	.92	.97		10		10		30		NW	1	1	0	Clear,
10	73	79	77		.94	.94	0.03		30	20		10				0	1	0	ditto,
11	73	80	77		30.04	30.00	.10			30		20				0	1	0	ditto,
12	75	80	76		.10	.04	.07			0		20				0	1	0	ditto,
13	74	79	75		.08	.08	.12	10		40		30				0	1	1	ditto,
14	72	77	75		.08	.03	.09	20		40		30				0	1	0	ditto,
15	72	77	75		.00	29.96	29.98	30		50		30				0	1	0	ditto,
16	72	77	75	F. M. 710.	29.90	.93	.95	40		50		30				0	1	0	ditto,
17	73	79	76		.96	.96	30.00	40		50		40				0	1	0	ditto,
18	74	79	76		30.02	30.02	.06	30		40		30				0	1	0	ditto,
19	73	78	74		.06	.03	.07	30		40		30				2	0	1	ditto,
20	72	77	73		.10	.04	.11	30		40		30				1	1	1	ditto,
21	71	77	73		.07	.04	.10	10		20		10		0.1		1	2	1	Cloudy,
22	69	79	74		.05	.02	.04	10		20		10				2	2	0	Clear,
23	71	77	75	L. Q. 712.	.01	29.94	29.97	10		20		10				0	1	1	ditto,
24	73	77	74		29.98	.93	.94	20		40		30				1	1	1	ditto,
25	71	77	74		.93	.90	.96	40		50		40				2	1	1	ditto,
26	71	77	72		.94	.92	.98	40		50		40				1	1	1	ditto,
27	70	75	72		30.02	30.02	30.06	40		50		40				1	1	1	ditto,
28	68	74	71		.05	.00	.05	40		50		40				1	1	1	ditto,
29	67	74	71		.05	29.97	.02	40		50		40				0	2	1	ditto,
30	67	74	72		.02	.92	.00	40		50		40				0	1	0	ditto,
mean	73	78[illegible]	75		[illegible]	[illegible]	[illegible]												

A General State of the Weather for November 1785.

		M.	N.	E.	
Thermometer,	Greateſt altitude, —	80°	85°	82°	75.
	Leaſt ditto, — —	67	74	71	
	Mean ditto, — —	73	78½	75	
Barometer,	Greateſt ditto, in. —	30 10	30 08	30.12	29 93.
	Leaſt ditto, — —	29.90	29 82	29.80	
	Mean ditto, — —	29.99	29.98	30.80	
	Greateſt variation, —	.20	.26	.32	.705.
	Mean denſity — —	.709	.700	.706	
Hygrometer,	— — —	15 d.	25 d.	20 d.	

Clear, — 26 days.
Cloudy, — 4 do.
Rain, — 4 times.
Quantity of do. — 0-5 inches.

Mean heat of the ſun at mid-day 100°.

Calcutta, December 1785.

Days.	Thermometer.			Mean density of each quarter of the Moon.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
								M.		N.		E.							
	M.	N.	E.		M.	N.	E.	d.	m.	d	m.	d.	m.		Point.	M.	N.	E.	
1	68	76	78	New Moon 714.	30.00	29.97	29.99	30		50		40		NW	WW	1	1	0	Clear,
2	70	75	72		29.99	.95	30.00	30		50		40				0	1	0	ditto,
3	70	75	72		30.03	.98	.02	30		50		40				0	2	0	ditto,
4	69	75	72		.04	.98	.03	30		50		40				0	0	0	ditto,
5	68	75	71		.01	.96	.00	30		50		40				1	1	1	ditto,
6	67	75	71		29.98	.95	29.99	25		45		45				0	1	0	ditto,
7	67	74	71		.99	.96	.99	25		45		35				1	1	1	ditto,
8	67	74	69	First Quarter 720.	.99	.99	30.04	30		45		35				0	1	1	ditto,
9	67	74	69		30.06	.99	.05	30		40		35.				0	1	1	ditto,
10	67	74	69		.05	.97	.04	35		45		40				0	1	0	ditto,
11	67	75	70		.05	.94	.10	30		50		40				1	1	0	ditto,
12	68	75	70		.08	.99	.08	30		55		40				0	1	1	ditto,
13	66	75	70		.09	30.05	.08	30		55		40				0	1	1	ditto,
14	64	74	68		.06	.04	.09	30		55		45				0	2	0	ditto,
15	63	71	66	Full Moon 728.	.07	.03	.09	30		60		45				1	1	1	ditto,
16	63	71	67		.08	.02	.05	30		55		40				1	1	0	ditto,
17	62	72	67		.04	.02	.04	25		35		40				0	1	1	ditto,
18	66	73	67		.03	.00	.02	25		35		40				0	1	1	ditto,
19	64	73	68		00.00	.00	.01	25		40		30				1	1	1	ditto,
20	63	73	69		29.97	29.97	.05	50		40		40				1	1	1	ditto,
21	65	73	69	Last Quarter 732.	30.02	.98	.02	30		50		45				0	1	1	ditto,
22	65	74	69		.00	.98	.03	35		40		30				0	1	0	ditto,
23	66	73	69		.05	.97	.01	35		40		30				0	1	0	ditto,
24	67	74	68		.03	.91	.06	35		45		35				0	1	1	ditto,
25	65	73	67		.04	.90	.02	30		45		40				0	1	1	ditto,
26	64	73	67		.00	.96	.00	30		50		40				1	1	0	ditto,
27	63	72	68		29.99	.95	.00	30		55		45				0	1	1	ditto,
28	64	73	68		.98	.97	.01	30		55		50				1	1	1	ditto,
29	64	73	67		.99	.97	.04	30		55		45				0	1	0	ditto,
30	64	73	68	New Moon 728.	30.06	30.04	.07	30		50		40				0	1	1	ditto,
31	63	74	67		.07	.06	.09	30		50		40				0	1	0	ditto,
mean	65¼	73½	69		30.02	29.98	30.03	30		50		40				½	1	⅓	

A General State of the Weather for December 1785.

		M.	N.	E.	
Thermometer,	Greateſt altitude, —	70°	76°	73°	69.
	Leaſt ditto, — —	63	71	66	
	Mean ditto, — —	65¼	73½	69	
Barometer,	Greateſt ditto, — —	30.09	30.06	30.10	30.01.
	Leaſt ditto, — —	29.97	29.90	29.99	
	Mean ditto, — —	30.02	29.98	30.03	
	Greateſt variation, —	.12	.16	.11	
	Mean denſity, — —	.721	.709	.719	.716.
Hygrometer,	— — —	30 d.	50 d.	40 d.	

Clear, — 31 days.

The weather throughout the month remarkably clear and pleaſant, and much milder than it is uſually at this ſeaſon of the year.

Mean heat of the ſun at mid-day about 96°.

II.

A Synopsis of the different Cases that may happen in deducing the Longitude of one Place from another, by Means of Arnold's Chronometers, and of finding the Rates when the Difference of Longitude is given.

BY MR. REUBEN BURROW.

IT was formerly the custom to give rules for calculation, without any investigation of their principles; but the contra y method has so much taken place of late, that those who are not acquainted with the theory of a subject, are seldom in a capacity of calculating at all; and those who are acquainted with it, must either lose time by recurring thereto continually, or run the hazard of often making mistakes. Indeed, the use of practical rules is so obvious, that *Newton* has often given them when he has omitted their demonstrations; and the want of them has been noted by *Bacon* among the deficiencies of learning. The Hindoos were so particularly attentive in that respect, that they usually gave two rules for the same operation; one couched in the shortest terms possible, and often in verse, for the ease of the memory; and the other more at length, as an explanation. It therefore is much to be wished that authors would revert to the ancient custom so far, as to pay some attention to the reduction of their knowledge to practice, that people may not be under the necessity of investigating rules at the time they want to use them.

The following is one rule, out of a great number, that I drew up for my own use, in determining the

From the foregoing *Diary* of the Weather, it may be remarked in regard to the variation of the Barometer, that during the cold ſeaſon, from November to March, the mercury is at its greateſt height; and at the loweſt during the rainy months of May, June, July, Auguſt, and September. The variation of the Thermometer, or the difference between the temperature of mid-day and that of the morning and evening is very trifling, ſeldom exceeding 3 or 4° during the rains, whereas, during the cold ſeaſon, the difference is 8 or 10°.

If the Watch be too		then		Is the mean time at the first place when the Watch was T at the second, or when the mean time at the second place was	Then, if the second place be from the first to the	Is the rate of the Watch, and	Is the difference of Longitude.
Fast for mean time at both places, and the Watch be	Gaining,	then	T—E—nr	T—e	E	(D—E+e) : n	E—e+nr
					W	(e—E—D) : n	e—E—nr
	Losing,	then	T—E+nr	T—e	E	(E—D—e) : n	E—e—nr
					W	(D+E—e) : n	e—E+nr
Slow for mean time at both places, and the Watch be	Gaining,	then	T+E—nr	T+e	E	(D+E—e) : n	e—E+nr
					W	(E—D—e) : n	E—e+nr
	Losing,	then	T+E—nr	T+e	E	(e—E—D) : n	e—E—nr
					W	(D—E+e) : n	E—e+nr
Slow for mean time at first place and fast at second place, and the Watch be	Gaining,	then	T+E+nr	T—e	E	(D+E+e) : n	nr—e—E
					W	(E—D+e) : n	E+e—nr
	Losing,	then	T+E+nr	T—e	E	Impossible	
					W	(D—E—e) : n	E+e—nr
Fast for mean time at first place and slow for mean time at second place, and the Watch be	Gaining,	then	T—E—nr	T+e	E	(D—E—) : n	E+e+nr
					W	Impossible	
	Losing.	then	T—E+nr	T+e	E	(E—D+e) : n	E+e—nr
					W	(D+E+e) : n	nr—E—e

ſituations of places in India; and I inſert it on account of its utility and eaſineſs of application.

Let E=Error of the Watch from mean time at the firſt place;

e=Error from mean time at the ſecond place;

T=Time by the Watch at the ſecond place, when the error was e;

D=Difference of Longitude between the places;

N=Interval of mean time between the obſervations at the two places (found by taking the interval by the Watch, and correcting it according to the eſtimated rate, &c.)

r=Rate of the Watch, or what it gains or loſes in a day of mean time. Then,

III.

MEMORANDUMS CONCERNING AN OLD BUILDING

In the Hadjipore District, near the Gunduc River, &c.

BY MR. REUBEN BURROW.

THE pyramids of *Egypt*, as well as those lately discovered in *Ireland* (and probably too the *Tower of Babel*) seem to have been intended for nothing more than images of *Mahadeo*.

Two of the *Sakkara* pyramids described by *Norden*, are, like many of the small ones, usually built of mud in the villages of *Bengal*. One of the pyramids of *Dashour*, drawn by *Pocock*, is nearly similar to that I am going to mention, except in the acuteness of the angle. Most of the *Pagodas* of the *Carnatic* are either complete or truncated pyramids; and an old stone-building without any cavity, which I saw in *Yambeah*, near the *Catabeda* river, on the *Arracan* coast, differed so little from a pyramid, that I did not suspect it was meant for the image of *Seeva*, till I was told it by the natives.

The largest building of the kind which I have yet seen in *India*, is about two days journey up the *Gunduc* river, near a place called *Kessereah*: it goes by the name of *Bheem Sain's Dewry*; but seems evidently intended for the well-known image of *Mahadeo*; having originally been a cylinder placed upon the frus-

is. What the intention of theſe extraordinary columns may have been originally, is perhaps not ſo eaſy to tell: at firſt ſight it would ſeem that they were for holding inſcriptions, becauſe thoſe of *Bettiah*, *Dehli*, and *Illahabad*, have inſcriptions (though in a character that has not been yet decyphered); but the pillar of *Singeah* ſeems to have none whatever, for ſome *Bramins* told me they attended at the time it was dug to the foundation, near twenty feet under ground, by a gentleman of *Patna*, who had hopes to have found ſome treaſures; and that there were not the leaſt veſtige of any inſcription upon it. Probably thoſe pillars, *Cleopatra's Needle*, and the *Devil's Bolts*, at *Boroughbridge*, may all have the ſame religious origin.

Perhaps the connection of time and place may apologize for the diverſity of the ſubject, in mentioning, that while I ſat under the ſhade of a large tree near the pyramid, on account of the ſultry heat, ſome of the people of the adjacent village came and played there with *cowries* on a diagram, that was formed by placing five points in a circular order, and joining every pair of alternate points by a line, which formed a kind of pentagon; this brought to my recollection a circumſtance told me by a gentleman in *England*,— That an old piece of ſilver plate had been dug out of the earth with ſuch a figure upon it; the uſe of it was totally unknown, as well as the age; and I was deſired to find what geometrical properties the figure poſſeſſed. One, I remember, was, that if any number of points whatever were placed in a circular order, and each two alternate points joined, then the ſum of all the ſalient angles of the figures would be equal to two right angles when the number of points was odd; but equal to four right angles when the number was even. *Euclid*'s properties of the angles of the triangle and trapezium, are particular caſes of theſe; but I had

tum of a cone, for the purpoſe of being ſeen at a diſtance. It is at preſent very much decayed; and it is not eaſy to tell whether the upper part of the cylinder has been globular or conical: a conſiderable quantity of the outſide is fallen down, but it ſtill may be ſeen a good diſtance up and down the river.

The day I went from the river to view it was ſo uncommonly hot, that the walk and a fever together obliged me to truſt to the meaſurements of a ſervant. For want of a better inſtrument, he took the circumference of the cylindrical part, in length of a ſpear, and from that as a ſcale, and a ſketch of the building taken at a diſtance, I deduced the following dimenſions. What dependence there may be on his meaſures, I cannot determine, but probably they are not very erroneous.

Diameter of the cylindrical part	—	64 feet
Height of the cylinder	—	65
Height of the conic fruſtrum on which the cylinder is placed	—	93
Diameter of the cone at the baſe	—	363

Both the cone and the cylinder were of bricks; thoſe of the laſt were of different ſizes, many of them two ſpans long and one broad; others were of the common ſize, but thinner; and they were well burnt, though bedded in mortar little better than mud. There did not appear any ſigns of the cylinder's being hollow: the conical part was overgrown with jungle; but I broke through it in ſeveral places, and found it everywhere brick.

I do not recollect whether it be viſible from the ſite of the ancient city where the famous pillar of *Singeah* ſtands, or not; but have a faint idea that it

fifteen cose distant: soon after, a heavy shower fell upon them for some hours, and the river was in a short time filled to the very banks, and continued so for many days; and large trees were torn up by the roots, and came driving down with such force by the torrent, that my boat was often endangered. Now, on these hills there was actually no snow whatever; and as the rise was obviously caused by the rains, it may reasonably be concluded that the same effect has the same cause in other places.

no ſuſpicion of the real intention of the figure till I ſaw the uſe here made of it. It ſeems, however, an argument in favour of the identity of the *Druids* and *Bramins*, as well as another well-known diagram, uſually called the *Walls of Troy*, which was uſed originally in the *Hindoo* aſtrology. Theſe figures, however, appear to have flowed from a much higher ſource, and to have relation to what *Leibnitz* had a diſtant idea of in his Analyſis of Situation, *Euclid* in his Poriſms, and *Girard* perhaps in his Reſtitution of them. In fact, as the modern Algebraiſts have the advantage of transferring a great part of their labour from the head to the hands, ſo there is reaſon to believe that the *Hindoos* had *mechanical methods of reaſoning geometrically*, much more extenſive than the elementary methods made uſe of at preſent; and that even their games were deduced from and intended perhaps to be examples of them: but this deſerves to be treated more at length elſewhere.

The ſame apology may perhaps excuſe my mentioning here, that the idea of the *Nile*'s deriving its floods from the melted ſnows, as well as the *Ganges*, appears to be rather imaginary; they ſeem to be cauſed principally by the rains; for the high hills beyond the *Herdwar* apparently retain the ſnow all the year, and therefore the quantity melted could never produce the enormous ſmell of the *Ganges*; not to mention that the effect of a thaw ſeems different from what would ariſe from the mere difference of heat, and therefore might partly take place in winter and the dry ſeaſon. That the rains are ſufficient for the purpoſe, without recurring to the hypotheſis of melted ſnows, appears from the following fact: — A little before I obſerved the aforeſaid pyramid, I had been a conſiderable diſtance up the *Gunduc*; the river was low for the time of the year, and the hills that ſkirt the borders of *Nepaul* were clear, and apparently not above

IV.

OBSERVATIONS ON SOME OF THE ECLIPSES OF JUPITER'S SATELLITES.

BY MR. REUBEN BURROW.

The following in the Ganges and Burrampooter Rivers.

Apparent time 1787. h d ′ ″	Sat.	Weather.	Im. or Em.	Place of Observation.
Sept. 23 11 41 9	2	Moderate,	Imm.	Bankipore Granary.
24 15 41 22	3	Ditto,	Imm.	Ditto.
Oct. 11 12 45 14	1	Ditto,	Imm.	Colgong; Cleveland.Bung.
23 10 26 20	3	Ditto,	Emer.	Mouth of Jellingy.
25 11 47 33	2	Ditto,	Imm.	Shore of Ganges S. of Pubna
25 16 42 40	1	Ditto,	Imm.	Ditto.
27 11 13 59	1	Ditto,	Imm.	Cossundah; Nullah.
30 14 35 16	3	Ditto,	Emer.	Dacca; Nabob's house.
Nov. 19 8 56 32	2	Ditto,	Imm.	Tealcopee, Burrampooter.
26 11 33 45	2	Ditto,	Imm.	Bakkamar Chorr.
26 13 13 57	1	Ditto,	Imm.	Ditto.
28 7 42 52	1	Ditto,	Imm.	Cazycotta.
Dec. 3 14 10 54	2	Hazy,	Imm.	Goalparah.
3 15 8 1	1	Moderate,	Imm.	Ditto.
5 7 51 59	3	Ditto,	Imm.	Ditto.
5 9 35 26	1	Ditto,	Imm.	Ditto.
10 16 45 14	2	Very hazy,	Imm.	Budjapore.
10 16 57 56	1	Moderate,	Imm.	Ditto.
12 11 26 9.	1	Hazy,	Imm.	Tingarchor.
12 11 48 40	3	Ditto,	Imm.	Ditto.
19 15 28 59	1	Ditto.	Emer.	Luckipore.

The following on the Aarracan Coast.

Apparent time 1788. d h ′ ″	Sat.	Weather.	Im. or Em.	Place of Observation.
Feb. 5 10 18 12	1	Moderate.	Emer.	Cheduba, Flag-staff Point.
12 12 13 54	1	A little hazy	Emer.	Ditto, Maykawoody Fort.
21 8 29 22	1	Moderate,	Emer.	Yambeah Ty Fort
23 10 57 53	2	Ditto,	Emer.	Ditto, Kyaonemo.
28 10 35 13	1	Ditto,	Emer.	Cheduba; Cedar Point.

Apparent time 1789. d h ′ ″	Sat.	Weather.	Im. or Em.	Place of Observations.
March 11 9 22 21:	1	Moderate.	Emers.	Mobarickpore Gaut.
18 11 23 56	1	Ditto.	Emer.	Chunar Fort.
20 9 4 40	2	Ditto.	Emer.	Benares Observatory.
27 7 59 16	1	Ditto.	Emer.	Bankypore Granary.
27 11 53 1	2	Ditto.	Emer.	Ditto.
29 10 31 10	3	Ditto.	Emer.	Ditto.
April 3 9 56 45:	1	Ditto.	Imm.	Patna; Chehelsuttoon.
10 11 59 48:	1	Very hazy.	Emer.	Mongeer, Rocky Point.
19 8 30 56	1	Hazy.	Emer.	Rajmahal.
26 10 31 22	1	Moderate.	Emer.	Teacally Dumdumma.

The following were observed at Russahpugly, near Calcutta.

Apparent time 1789. d h ′ ″	Sat.	Weather.	Im. or Em.	Place of Observation.
May 12 8 48 50	1	Moderate.	Emer.	
Dec. 19 11 59 15	1	Hazy.	Imm.	
19 14 5 33	3	Ditto.	Imm.	
22 11 23 4	2	Moderate	Imm.	
26 13 49 38	1	Ditto.	Imm.	
1790.				
Jan. 2 15 39 32	1	Ditto	Imm.	
18 13 44 51	1	Mist&wind.	Imm.	
23 10 49 48	2	Ditto.	Imm.	
24 9 40 57	3	Hazy.	Imm.	
27 10 8 19	1	Moderate.	Imm.	
31 13 36 35	3	Very hazy.	Imm.	
Feb. 1 17 32 48	1	Hazy.	Imm.	
3 12 1 30	1	Moderate.	Imm.	
17 10 38 18	2	Ditto.	Emer.	
19 12 33 56	1	Ditto.	Emer.	
26 14 28 38	1	Hazy.	Emer.	
28 8 57 22	1	Moderate.	Emer.	
March 1 9 0 52	3	Ditto.	Emer.	
5 16 24 13	1	Hazy.	Emer.	
16 7 18 14	1	Moderate.	Emer.	
23 9 14 25	1	Ditto.	Emer.	
26 7 36 11	4	Ditto.	Imm.	

The two following were at Jowgatta, near Krishnagur.

Apparent time 1790. d h ′ ″	Sat.	Weather.	Im. or Em.	Place of Observations.
April 22 10 27 30	2	Moderate.	Emer.	
22 11 31 10	1	Ditto.	Emer.	

The following were observed at Colonel Watson's Docks at Kidderpore, near the Mouth of the Nullah.

Apparent time 1788. d h ′ ″	Sat.	Weather,	Im. or Em.	Place of Observation.
March 15 8 36 36	1	Moderate,	Emer.	
19 7 54 2	2	Ditto,	Emer.	
22 10 34 41	1	Ditto,	Emer.	
31 7 1 24	1	Ditto,	Emer.	

The following in the Ganges and Rohilcund, &c.

Apparent time 1788. d h ′ ″	Sat.	Weather.	Im. or Em.	Place of Observation.
Oct. 8 14 35 30	3	Moderate,	Emer.	Bankipore.
29 14 3 4	1	Ditto,	Imm.	Benares Observatory.
Nov. 1 15 42 36	2	Ditto,	Imm.	Chunar Camp.
12 17 44 23	1	Hazy,	Imm.	Illahabad Fort.
14 12 11 29	1	Ditto,	Imm.	Correahcotta.
20 10 48 28	3	Moderate,	Imm.	In the Ganges 3m below Nudjiff Ghur.
10 14 9 52:	3	Ditto,	Emer.	
21 13 58 32	1	Ditto,	Imm.	Janjemow.
27 14 44 29	3	Ditto,	Imm.	Cawnpore; Magazine Gaut
28 15 49 22	1	Ditto,	Imm.	Ditto.
30 10 17 2	1	Ditto,	Imm.	Ditto.
Dec. 3 15 2 23	2	Ditto,	Imm.	Joognagpore Gaut.
7 12 6 5	1	Ditto,	Imm.	East of Canonge, 0° 2′ 29″.
14 13 54 57	1	Ditto,	Imm.	Futtyghur Magazine.
21 9 20 53	2	Ditto,	Imm.	Ditto, Dr. Cook's Gaut.
21 15 44 51	1	Ditto,	Imm.	Ditto.
23 10 12 34	1	Ditto,	Imm.	Ditto.
28 17 35 22:	1	Hazy,	Imm.	Cutterah.
30 12 2 48	1	Moderate,	Imm.	Fereedpore.
1789.				
Jan. 4 14 26 28	2	Ditto,	Imm.	Nabobgunge.
6 13 53 41	1	Ditto,	Imm.	Pillibeat; Eed Gah.
8 8 20 16	1	Ditto,	Imm.	Shairgorr.
9 14 10 39	3	Ditto,	Imm.	Bowerkah.
22 14 15 50	1	Ditto,	Emer.	Bhyrah.
24 8 44 1	1	Ditto,	Emer.	Takooradwar.
29 14 15 36	2	Ditto,	Emer.	Nidjibabad.
29 16 7 14	1	Hazy,	Emer.	Ditto.
Feb. 14 13 22 49	3	Moderate,	Emer.	Amroah.
14 14 23 40	1	Ditto,	Emer.	Ditto.
16 8 48 8	2	Ditto,	Emer.	Husseppore.
16 8 51 53	1	Hazy,	Emer.	Ditto.
17 6 53 11:	4	Ditto,	Imm.	Seersah.
17 11 6 44:	4	Ditto,	Emer.	Ditto.
23 10 50 1	1	Ditto,	Emer.	Chandowsy.
March 2 12 48 13	1	Moderate,	Emer.	Futtyghur, Dr. Cook's Gaut.
2 14 11 10	2	Ditto,	Emer.	Ditto.

V.

A PROOF THAT THE HINDOOS HAD THE BINOMIAL THEOREM.

BY MR. REUBEN BURROW.

THE *iſlands* in the Bay of *Bengal* are, many of them, covered with ſhells and marine productions to a great height, and there are beds of large ſmooth pebbles near the *Herdwar*, ſome hundreds of feet above the preſent level of the *Ganges*; the ſea has therefore gradually been retiring, and conſequently the poſition of the Equator was formerly farther north than it is at preſent in this part of the earth; and if a few ſimilar obſervations were made in other countries, it is evident that the ancient ſituation of the pole upon the ſurface of the earth might be determined ſufficiently near for explaining many difficulties and paradoxes in geographical antiquities. For this purpoſe alſo it would be adviſeable to have permanent meridian lines drawn in high northern latitudes, to be compared in ſucceeding ages, and alſo to have marks cut upon rocks in the ſea, to ſhew the proper level of the water.

In the aforeſaid poſition of the Equator, the ſands of *Tartary* were inhabitable, and the Siberian climates temperate; the deſerts of the *Leſſer Bukharia* were then part of the ſeat of the *Paradiſe of Moſes*; and the four ſacred rivers of *Eden* went through *India*, *China*, *Siberia*, and into the *Caſpian Sea*, reſpectively. This appears from a *Bramin* map of the world in the

Thoſe to the 31ſt of March 1788, were obſerved with a glaſs made by *Watkins*, that magnified about 110 times; thoſe from thence to the 12th of May 1790, were obſerved with one of *Ramſden*'s teleſcopes of the ſort lately made for the navy; and the remainder with a glaſs made by *Dolland*, that magnifies about eighty times.

I ſhall conclude theſe obſervations with a remark that highly concerns both the buyers and makers of teleſcopes; namely, that the parts which compoſe the object-glaſs of an Achromatic, are generally put together in ſuch a manner that they cannot be taken aſunder; and the braſs part that they are bedded in, ſhoots a number of chymical ramifications between the glaſſes, that in the courſe of a year renders a teleſcope of little or no ſervice. This defect the maker may eaſily remove, by making the compound object-glaſs capable of being taken to pieces, or the parts in ſome other ſubſtance not liable to this defect.

probably too the eſtabliſhed religion of the *Greeks* and the *Eleuſinian* myſteries may only be varieties of the two different ſects. That the *Druids* of *Britain* were *Bramins*, is beyond the leaſt ſhadow of a doubt; but that they were all murdered and their ſciences loſt, is out of the bounds of probability; it is much more likely that they turned Schoolmaſters, Freemaſons, and Fortune-tellers, and in this way part of their ſciences might eaſily deſcend to poſterity, as we find they have done. An old paper, ſaid to have been found by *Locke*, bears a conſiderable degree of internal evidence both of its own antiquity and of its own idea; and on this hypotheſis it will be eaſy to account for many difficult matters that perhaps cannot ſo clearly be done on any other, and particularly of the great ſimilarity between the *Hindoo* ſciences and ours: a compariſon between our oldeſt ſcientific writers and thoſe of the *Hindoos* will ſet the matter beyond diſpute; and fortunately the works of *Bede* carry us twelve hundred years back, which is near enough to the times of the *Druids* to give hopes of finding there ſome of their remains. I ſhould have made the compariſon myſelf, but *Bede* is not an author to be met with in this country; however, I compared an aſtrolabe in the *Nagry* character (brought by Dr. *Mackinnon* from *Jynagur*) with *Chaucer*'s deſcription, and found them to agree moſt minutely: even the center-pin, which *Chaucer* calls "the horſes," has a horſe's head upon it in the inſtrument; therefore if *Chaucer*'s deſcription ſhould happen to be a tranſlation from *Bede*, it will be a ſtrong argument in favour of the hypotheſis, for we then could have nothing from the *Arabians*. What *Bungey* and *Swiſſet* may contain, will alſo deſerve inquiry; and that the compariſon may be the readier made, where the books are procurable, I mean very ſhortly to publiſh tranſlations of the *Leelavotty* and *Beej Geneta*, or the arithmetic and algebra of the *Hindoos*.

Sanſcrit language, which I met with about two years ago in the higher part of *India*, together with a valuable treatiſe of geography upon the ſyſtem of *Boodh*; both of which I communicated, with my idea on the ſubject, to Mr. *Wilford*, of the *Bengal* Engineers; and from him the world may expect ſhortly to be favoured with the firſt true repreſentation of Scriptural and *Hindoo* Geography.

From the aforeſaid country the *Hindoo* religion probably ſpread over the whole earth: there are ſigns of it in every northern country, and in almoſt every ſyſtem of worſhip. In *England* it is obvious; Stonehenge is evidently one of the temples of *Boodh*; and the arithmetic, the aſtronomy, aſtrology, the holidays, games, names of the ſtars, and figures of the conſtellations, the ancient monuments, laws, and even the languages of the different nations, have the ſtrongeſt marks of the ſame original. The worſhip of the ſun and fire, human and animal ſacrifice, &c. have apparently once been univerſal: the religious ceremonies of the papiſts ſeem in many parts to be a mere ſervile copy of thoſe of the *Goſeigns* and *Fakeers*; the chriſtian aſcetics were very little different from their filthy original the *Byraggys*, &c.; even the hell of the northern nations is not at all like the hell of the ſcripture, except in ſome few particulars; but it is ſo ſtriking a likeneſs of the hell of the *Hindoos*, that I ſhould not at all be ſurprized if the ſtory of the ſoldier that ſaw it in *Saint Patrick*'s purgatory, deſcribed in *Matthew Paris*'s hiſtory, ſhould hereafter turn out to be merely a tranſlation from the *Sanſcrit*, with the names changed. The different tenets of *Popery* and *Deiſm* have a great ſimilarity to the two doctrines of *Brahma* and *Boodh*; and as the *Bramins* were the authors of the Ptolemaic ſyſtem, ſo the *Boodhiſts* appear to have been the inventors of the ancient *Philolaic*, or *Copernican*, as well as of the doctrine of attraction; and

from ſome of their works of no great antiquity; the ſame remarks are applicable to their coſmographical remains, in ſome of which there are indications of an aſtronomy ſuperior to that of the *Soorya Siddhant*, and ſuch popular treatiſes.

Till we can therefore find ſome of their more ſuperior works, it muſt be rather from the form and conſtruction of their aſtronomical tables and rules, and the properties implied in their accidental ſolutions of queſtions, &c. that we can judge what they formerly knew, than otherwiſe. That they are acquainted with a differential method ſimilar to *Newton*'s, I ſhall give many reaſons for believing, in a treatiſe on the principles of the *Hindoo* aſtronomy, which I began more than three years ago, but was prevented from finiſhing, by a troubleſome and laborious employment that for two years gave me no leiſure whatever; and which (though the ſmall time I had to ſpare ſince has been employed in writing a comment on the works of *Newton*, and explaining them to a very ingenious native who is tranſlating them into *Arabic*) I hope ere long to have an opportunity of completing. At preſent I ſhall only give an extract of a paper explaining the conſtruction of ſome tables, which firſt led me to the idea of their having a differential method: it is part of one, out of a number of papers that were written in the latter part of the year 1783 and the beginning of 1784, and of which ſeveral copies were taken by different people, and ſome of them ſent to *England*. This particular extract was to inveſtigate the rules at pages 253, 254, and 255 of Monſ. *Gentil*'s Voyage, of which the author ſays, "Je n'ai pu ſavoir ſur quels "principes cette table eſt fondee," &c. and is as follows:

"Now, by proceeding in the manner explained in "the aforeſaid paper, to calculate the right aſcenſion

It is much to be feared, however, that many of the beſt treatiſes of the *Hindoos* are loſt, and that many of thoſe that remain are imperfect. By the help of a *Pundit* I tranſlated part of the *Beej Ganeta* near ſix years ago, when no *European* but myſelf, I believe, even ſuſpected that the *Hindoos* had any Algebra; but finding that my copy was imperfect, I deferred completing the tranſlation, in hopes of procuring the remainder. I have ſince found a ſmall part more, and have ſeen many copies; but from the plan of the work (which in my opinion is the beſt way of judging) they ſtill ſeem to be all imperfect, though the copier generally takes care to put at the end of them that they are complete. I have the ſame opinion of the *Leelavatty*, and for the ſame reaſon: indeed, it is obvious that there muſt have been treatiſes exiſting where algebra was carried much farther; becauſe many of their rules in aſtronomy are approximations deduced from infinite ſeries, or at leaſt have every appearance of it; ſuch, for inſtance, as finding the ſine from the arc, and the contrary; and finding the angles of a right angled triangle from the hypothenuſe and ſides, independent of tables of ſines; and ſeveral others of a ſimilar nature, much more complicated. I have been informed by one of their *Pundits*, that, ſome time ago, there were other treatiſes of Algebra beſides that juſt mentioned, and much more difficult, though he had not ſeen them; and therefore, as it is poſſible they may ſtill be exiſting, and yet be in danger of periſhing very ſoon, it is much to be wiſhed that people would collect as many of the books of ſcience as poſſible (their poetry is in no danger) and particularly thoſe of the doctrine of *Boodh*, which perhaps may be met with towards *Thibet*. That many of their beſt books are depraved and loſt is evident, becauſe there is not now a ſingle book of geometrical elements to be met with; and yet that they had elements not long ago, and apparently more extenſive than thoſe of *Euclid*, is obvious

" that, by adding of the difference, the arcs them-
" ſelves may be found nearly; the reaſon will appear
" from the following inveſtigation. Let N be the equa-
" torial ſhadow of the *Bramins* in *Bingles*, then 720 the
" length of the *Gnomon*, or twelve *Ongles*, will be to N
" the ſhadow, as radius to the tangent of the latitude;
" and radius to the tangent of the latitude as the tangent
" of the declination to the ſine of the aſcenſional dif-
" ference; conſequently 720 is to N as the tangent of
" declination to the ſine of the aſcenſional difference.
" Now if the declinations for one, two, and three ſines
" be ſubſtituted in the laſt proportion, we get the ſines
" of the three aſcenſional differences in terms of N
" and known quantities; and, if theſe values be ſub-
" ſtituted in the Newtonian form for finding the arc
" from the ſine, we get the arcs in parts of the radius;
" and if each of theſe be multiplied by 3600 and
" divided by 6,28318, the values come out in puls
" of a *Gurry* if N be in *Bingles*, but in parts of a
" *Gurry* if N be in *Ongles*; and by taking the doubles,
" we get the values nearly as follows:

Values.	*Difference.*	
0,00000 N		
0,33056 N	0,33056 N = 1-3 N nearly,	the values
0,59928 N	0,26872 N = 4-5 of 1-3 N nearly,	uſed by the
0,70860 N	0,10932 N = 1-3 N nearly,	*Bramins.*

" Now, becauſe the values in the firſt column are
" doubles of the aſcenſional differences for one, two,
" and three ſines, their halves are the aſcenſional dif-
" ferences in parts of a *Gurry*, ſuppoſing N to be
" in *Ongles*; and if each of theſe halves be multi-
" plied by ſixty, the products, namely, 9,9163 N,
" 17,9784 N, and 21,2380 N will be the ſame in
" puls of a *Gurry*; and if to get each of theſe nearly
" in round numbers, the whole be multiplied by three,
" and afterwards divided by three, the three products

" and ascensional difference for *Tirvalour*, and af-
" terwards taking the differences algebraically, and re-
" ducing them to puls of a *Gurry*, as in the follow-
" ing table, the principles of the method will be
" evident.

S	Obl. Ascent. R. A. Asc. Diff.	First diff. of Obl. Ascension.	Do. reduced to Puls of a Gurry.	Do. farther reduced.
	° ′ ° ′	° ′ ° ′		
0	0 0—0 0			
1	27 54—2 19	27 54—2 19	279—23	256
2	57 49—4 13	29 55—1 54	299—19	280
3	90 0—4 59	32 11—0 46	322— 8	314
4	122 11—4 13	32 11+0 46	322+ 8	330
5	152 6—2 19	29 55+1 54	299+19	318
6	180 0+0 0	27 54+2 19	279+23	302
7	200 54+2 19	27 54+2 19	279+23	302
8	237 49+4 13	29 57+1 54	299+19	318
9	270 0+4 59	32 11+0 46	322+ 8	330
10	302 11+4 13	32 11—0 46	322— 8	314
11	332 6+2 19	29 55—1 54	299—19	280
12	360 0+0 0	27 54—2 19	279—23	256

" The fifth and sixth columns sufficiently explain
" the tables in page 253 and 254 of M. *Gentil*; but
" there remains a part more difficult, namely, why in
" calculating the *Bauja*," or the doubles of the first
differences of the ascensional difference " $\frac{20}{60}$ of the
" length of the shadow is taken for the first; $\frac{4}{5}$ of
" the first term for the second; and $\frac{1}{5}$ of the first
" term for the third." " The primary reason of
" taking differences here, seems to be that the
" chords may be nearly equal to the arcs, and

method, ſaid he had found ſome indications of the *Binomial Theorem* in much older authors. The method however by which that great man inveſtigated the powers independent of each other, is exactly the ſame as that in the following tranſlation from the *Sanſcrit*.

" A *Raja*'s palace had eight doors; now theſe doors
" may either be opened by one at a time, or by two
" at a time, or by three at a time, and ſo on through
" the whole, till at laſt all are opened together. It is
" required to tell the numbers of times that this can
" be done?

" Set down the number of the doors, and proceed
" in order, gradually decreaſing by one to unity,
" and then in a contrary order, as follows:

8 7 6 5 4 3 2 1
1 2 3 4 5 6 7 8

" Divide the firſt number eight by the unit beneath
" it, and the quotient eight ſhews the number of
" times that the doors can be opened by one at a time.
" Multiply this laſt eight by the next term ſeven,
" and divide the product by the two beneath it, and
" the reſult twenty-eight is the number of times that
" two different doors may be opened; multiply the
" laſt found twenty-eight by the next figure ſix, and
" divide the product by the three beneath it, and the
" quotient fifty-ſix ſhews the number of times that
" three different doors may be opened. Again, this
" fifty-ſix multiplied by the next five, and divided by
" the four beneath it, is ſeventy, the number of
" times that four different doors may be opened. In
" the ſame manner fifty-ſix is the number of fives that
" can be opened: twenty-eight the number of times
" that ſix can be opened: eight the number of times

"will be 29,75 N, 53,94 N, and 63,77 N, which are
"nearly equal to thirty N, fifty-four N, and sixty-
"four N respectively; and hence the foundation of the
"*Bramin* rule is evident, which directs to multiply
"the equatorial shadow by thirty, fifty-four, and
"sixty-four respectively; and to divide the products
"by three for the *Chorardo* in puls: and these parts
"answer to one, two, and three signs of longitude
"from the true equinox; and therefore the *Ayanongsh*,
"or *Bramin* precession of the equinox, must be add-
"ed, to find the intermediate *Chorardo* by propor-
"tion."

Though the agreement of this investigation with the *Bramin* results, is no proof that the *Hindus* had either the differential method, or Algebra, it gave me at the time a strong suspicion of both; and yet, for want of knowing the name that Algebra went by in *Sanscrit*, I was near two years before I found a treatise on it, and even then I should not have known what to enquire for, if it had not come into my mind to ask how they investigated their rules. Of the differential method, I have yet met with no regular treatise, but have no doubt whatever that there were such, for the reasons I before hinted at; and I hope others will be more fortunate in their enquiries after it than myself.

With respect to the *Binomial Theorem*, the application of it to fractional indices will perhaps remain for ever the exclusive property of *Newton*; but the following question and its solution evidently shew that the *Hindoos* understood it in whole numbers to the full as well as *Briggs*, and much better than *Pascal*. Dr. *Hutton*, in a valuable edition of *Sherwin*'s tables, has lately done justice to *Briggs*; but Mr. *Whitchell*, who some years before pointed out *Briggs* as the undoubted inventor of the differential

them dead, except thoſe which were a foot above the high water-mark of that day, which was February 2, 1788. The ſhells were evidently altered a little in proportion to their height above the water, but by no means ſo much as to induce one to believe that the rock had been many years out of it. All the adjacent iſlands and the coaſt ſhewed ſimilar appearances, and therefore it was evidently no partial elevation by ſubterraneous fires, or any thing of that ſort; this is alſo apparent from the iſland of *Cheduba* itſelf, in which there is a regular ſucceſſion of ſea-beaches and ſhells more and more decayed to a great height. By a kind of vague eſtimation from the trees and the coaſts and ſhells, &c. (on which however there is not the leaſt dependence) I ſuppoſed that the ſea might be ſubſiding at the rate of about three inches in a year.

"that ſeven can be opened; and laſtly, one is the
"number of times the whole may be opened together;
"and the ſum of all the different times is 255."

The demonſtration is evident to mathematicians; for as the ſecond term's coefficient in a general equation ſhews the ſum of the roots, therefore, in the n power of $1+1$, where every root is unity, the coefficient ſhews the different *ones* that can be taken in n things: alſo, becauſe the third term's coefficient is the ſum of the products of all the different twos of the roots, therefore when each root is unity, the products of each two roots will be unity, and therefore the number of units, or the coefficient itſelf, ſhews the number of different *twos* that can be taken in n things. Again, becauſe the fourth term is the ſum of the products of the different threes that can be taken among the roots, therefore, when each root is in unity, the product of each three will be unity, and therefore every unit in the fourth will ſhew a product of three different roots, and conſequently the coefficient itſelf ſhews all the different *threes* that can be taken in n things; and ſo for the reſt. I ſhould not have added this, but that I do not know well where to refer to it.

P. S. There is an obſervation, perhaps worth remarking, with reſpect to the change of the *poles*; namely, that the ſmall rock-oyſters are generally all dead within about a foot above high water-mark; now poſſibly naturaliſts may be able to tell the age of ſuch ſhells nearly by their appearance; and if ſo, a pretty good eſtimate may be formed of the rate of alteration of the level of the ſea in ſuch places where they are; for I made ſome aſtronomical obſervations on a rock in the ſea near an iſland about ſeven miles to the ſouth of the iſland of *Chedhuba*, on the *Aracan* coaſt, whoſe top was eighteen feet above high water-mark, and the whole rock covered with thoſe ſhells faſt grown to it, but all of

CONTENTS

OF THE

SECOND VOLUME.

*** There was not room in this volume for the Differtations on the Mufic of the *Hindus* and the Laws of *Siam*; but they will appear in the Third volume, for which ample materials have been collected.

ADDITIONS.

Page 154. Note. The *gunja*, I find, is the *Abrus* of our botaniſts ; and I venture to deſcribe it from the wild plant compared with a beautiful drawing of the flower magnified, with which I was favoured by Dr. *Anderſon.*

CLASS XVII. *Order* IV.

Cal. Perianth funnel-ſhaped, indented above.

Cor. Cymbiform ; *Awning* roundiſh, pointed, nerved.

Wings lanced, ſhorter than the awning.

Keel rather longer than the wings.

Stam. Filaments nine, ſome ſhorter ; united in two ſets at the top of a divided, bent, awl-ſhaped body.

Piſt. Germ inſerted in the calyx. *Style* very minute at the bottom of the divided body. *Stigma*, to the naked eye, obtuſe ; in the microſcope, feathered.

Per. A legume. *Seeds*, ſpheroidal ; black or white, or ſcarlet with black tips.

Leaves pinnated ; ſome with, ſome without, an odd leaflet.

Page 361. See the Plate Fig. 1. The female inſect in its *larva* ſtate. 2. The egg, which produces the male. 3. The male inſect. 4. The head with jointed antennæ. 5. The wings on one ſide. The preceding figures are much magnified, but in juſt proportion. 6. A piece of *Lac*, of its natural ſize. 7. The inſide of the external coat of the cells. 8. One of the utriculi. The two laſt figures are a little magnified.

THE END OF THE SECOND VOLUME.

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